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**STEPPING OUT OF THE SHADOWS:
LEVERAGING THE COMMUNITY TO STOP THE
SEXUAL EXPLOITATION OF MINORS**

Yerkes, Elisabeth

Monterey, CA; Naval Postgraduate School

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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

**STEPPING OUT OF THE SHADOWS:
LEVERAGING THE COMMUNITY TO STOP
THE SEXUAL EXPLOITATION OF MINORS**

by

Elisabeth Yerkes

March 2021

Co-Advisors:

Christopher Bellavita (contractor)
Erik J. Dahl

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REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE March 2021		3. REPORT TYPE AND DATES COVERED Master's thesis
4. TITLE AND SUBTITLE STEPPING OUT OF THE SHADOWS: LEVERAGING THE COMMUNITY TO STOP THE SEXUAL EXPLOITATION OF MINORS				5. FUNDING NUMBERS
6. AUTHOR(S) Elisabeth Yerkes				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000				8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A				10. SPONSORING / MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.				12b. DISTRIBUTION CODE A
13. ABSTRACT (maximum 200 words) The online transmission of child pornography has exploded in recent years, and law enforcement does not have the resources to stop it. This thesis seeks to determine the advantages and disadvantages of using citizen volunteers to help investigate child sexual abuse material (CSAM). Specifically, it investigates whether incorporating civilians into certain aspects of CSAM investigations could assist law enforcement in filling gaps in resources needed to ensure all recovered images be fully investigated in less time. To test the hypothesis that creating opportunities for civilians to assist law enforcement will positively impact law enforcement's ability to investigate CSAM offenses, this thesis uses policy analysis to compare three policy-option alternatives. The results confirm the hypothesis by demonstrating that incorporating skilled civilian volunteers into a national volunteer program is an effective option to assist law enforcement in CSAM investigations. These results suggest law enforcement and policy makers should establish a national volunteer program that allows skilled volunteers to assist law enforcement agencies around the nation in certain time-consuming or technically complex aspects of investigations. Doing so opens up resources to law enforcement agencies and provides much-needed assistance to investigators while allowing volunteers meaningful opportunities to use their skills and time to combat the sexual exploitation of children.				
14. SUBJECT TERMS CSAM, child sexual abuse material, volunteers, crowd sourcing, open-source investigative techniques, OSINT				15. NUMBER OF PAGES 111
				16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified		18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified		19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified
20. LIMITATION OF ABSTRACT UU				

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**STEPPING OUT OF THE SHADOWS: LEVERAGING THE COMMUNITY
TO STOP THE SEXUAL EXPLOITATION OF MINORS**

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requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)**

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ABSTRACT

The online transmission of child pornography has exploded in recent years, and law enforcement does not have the resources to stop it. This thesis seeks to determine the advantages and disadvantages of using citizen volunteers to help investigate child sexual abuse material (CSAM). Specifically, it investigates whether incorporating civilians into certain aspects of CSAM investigations could assist law enforcement in filling gaps in resources needed to ensure all recovered images be fully investigated in less time. To test the hypothesis that creating opportunities for civilians to assist law enforcement will positively impact law enforcement's ability to investigate CSAM offenses, this thesis uses policy analysis to compare three policy-option alternatives. The results confirm the hypothesis by demonstrating that incorporating skilled civilian volunteers into a national volunteer program is an effective option to assist law enforcement in CSAM investigations. These results suggest law enforcement and policy makers should establish a national volunteer program that allows skilled volunteers to assist law enforcement agencies around the nation in certain time-consuming or technically complex aspects of investigations. Doing so opens up resources to law enforcement agencies and provides much-needed assistance to investigators while allowing volunteers meaningful opportunities to use their skills and time to combat the sexual exploitation of children.

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TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	PROBLEM STATEMENT	1
B.	RESEARCH QUESTION	3
C.	LITERATURE REVIEW	3
1.	Volunteer Police Forces.....	4
2.	Benefits of Law Enforcement Volunteers	5
3.	Drawbacks to Volunteer Programs	8
4.	Conclusion	10
D.	SIGNIFICANCE	11
E.	RESEARCH DESIGN	13
F.	ROADMAP.....	15
 II.	 BACKGROUND INTO CHILD SEXUAL ABUSE MATERIAL	
	INVESTIGATIONS.....	17
A.	DIFFICULTY IN CHILD SEXUAL ABUSE	
	INVESTIGATIONS.....	17
1.	Volume and Time.....	17
2.	Detection	19
3.	Live Streaming Child Sexual Abuse.....	21
B.	THE HUMAN TOUCH.....	22
1.	Human Intelligence	23
2.	Crowdsourcing Tips in Child Sexual Abuse Investigations	24
 III.	 USING THE CROWD.....	 29
A.	CROWDSOURCING	29
1.	Crowdsourcing Campaigns in CSAM Investigations.....	29
2.	Crowd Sourcing Communities.....	33
B.	VOLUNTEER PROGRAMS HELPING LAW	
	ENFORCEMENT	38
1.	Research Data on Volunteer Programs	38
2.	Volunteer CSAM Programs.....	41
3.	Volunteers in Missing Persons Cases	43
C.	IMPORTANCE OF CITIZEN ENGAGEMENT	46
 IV.	 POLICY OPTIONS ANALYSIS.....	 49
A.	ESTABLISH CRITERIA	50
1.	Efficiency	50

2.	Opportunity to Gain Intelligence	51
3.	Costs	51
4.	Implementation	52
5.	Congressional Support	52
B.	EVALUATE POLICY OPTIONS.....	52
1.	Option 1: Maintain Current Model.....	53
2.	Option 2: National Crowdsourcing Model	57
3.	Option 3: National Volunteer Program	65
C.	RESULTS	74
V.	CONCLUSION	75
A.	FINDINGS	75
B.	NEXT STEPS	77
C.	CONCLUSION	78
	LIST OF REFERENCES	81
	INITIAL DISTRIBUTION LIST	91

LIST OF FIGURES

Figure 1.	Bellingcat Stop Child Abuse Trace an Object Summary 2019–2020.....	36
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LIST OF TABLES

Table 1.	Policy Options Evaluation Template	53
Table 2.	Policy Option 1 Evaluation	57
Table 3.	Policy Option 2 Evaluation	65
Table 4.	Policy Options 3 Evaluation	74

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LIST OF ACRONYMS AND ABBREVIATIONS

AMBER	America's Missing: Broadcast Emergency Response
BJA	Bureau of Justice Assistance
CART	Child Abduction Response Team
CSAM	child sexual abuse material
ECAP	Endangered Child Alert Program
Europol	European Union Agency for Law Enforcement Cooperation
FBI	Federal Bureau of Investigation
GEN	Global Emancipation Network
ICAC	Internet Crimes Against Children
ICSE	International Child Sexual Exploitation Database
ILF	Innocent Lives Foundation
NamUS	National Missing and Unidentified Person System
NCIC	National Crime Information Center
NCMEC	National Center for Missing and Exploited Children
NGO	non-governmental organization
OSINT	open source intelligence
VIDTF	Victim Identification Task Force
WEA	Wireless Emergency Alert

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EXECUTIVE SUMMARY

The online transmission of child sexual abuse material and other cyber sexual crimes has exploded in recent years, and law enforcement does not have the resources to stop it. The volume of child sexual abuse material reported to law enforcement is staggering. In 2019, the National Center for Missing and Exploited Children (NCMEC) received approximately 16.9 million reports comprising 69.1 million images, videos, and files.¹ The number of images has exceeded law enforcement's current capacity to review and investigate such cases.

Investigations into online child sexual abuse are extremely complex and require a great deal of time and resources to analyze a single image.² These intricate investigations, coupled with high volume and too few specialists to investigate, create tremendous backlogs of evidence needing to be reviewed.³ Law enforcement officers who investigate online child sexual abuse materials note that their main challenges are the quantity of evidence needing to be examined and the lack of funding and staffing needed to accomplish this task.⁴

Many law enforcement agencies already rely on citizens to assist in accomplishing their missions through various means including crowdsourcing and volunteering. While crowdsourcing serves as a way to develop leads, volunteers with police agencies enhance police functions to deter and solve crimes while simultaneously compensating for limited resources. One of the most recognized reasons agencies seek volunteers is a lack of fiscal

¹ "About NCMEC", National Center For Missing and Exploited Children, accessed April 13, 2020, <https://www.missingkids.org/footer/media/keyfacts>.

² Ben Hitchcock, Nhien-An Le-Khac, and Mark Scanlon, "Tiered Forensic Methodology Model for Digital Field Triage by Non-Digital Evidence Specialists," *Digital Investigation*, DFRWS Europe, 16 (2016): S75–85, <https://doi.org/10.1016/j.diin.2016.01.010>; and U.S. Department of Homeland Security, *Strategy to Combat Human Trafficking, the Importation of Goods Produced with Forced Labor, and Child Sexual Exploitation* (Washington, DC: Department of Homeland Security, 2020), 18, https://www.dhs.gov/sites/default/files/publications/20_0115_plcy_human-trafficking-forced-labor-child-exploit-strategy.pdf.

³ Hitchcock, Le-Khac, and Scanlon, "Tiered Forensic Methodology," 1.

⁴ Sean E. Goodison, Robert C. Davis, and Brian A. Jackson, *Digital Evidence and the U.S. Criminal Justice System: Identifying Technology and Other Needs to More Effectively Acquire and Utilize Digital Evidence* (Santa Monica, CA: RAND, 2015), 1, https://www.rand.org/pubs/research_reports/RR890.html.

or other resources required to accomplish the goals of the agency and meet the needs of the community.⁵

Using policy analysis, this thesis analyzed the advantages and disadvantages of using citizen volunteers to help investigate child sexual abuse material (CSAM). To do so, this thesis demonstrated ways citizens assist law enforcement through formal volunteer programs and crowdsourcing as well as highlighting the greatest challenges cited by law enforcement in CSAM investigations which included high volume of images with insufficient resources or personnel to fully investigate the images. From the evidence presented, five criteria of efficiency, opportunity to gain intelligence, cost, implementation, and congressional support were established to assist in comparing three policy alternatives: maintaining the status quo, creating a national crowdsourcing model, and establishing a national volunteer program. The five criteria were weighed, reviewed, analyzed, and scored for each policy option.

After assessing potential alternatives through the evaluative criteria, each policy option was ranked, revealing establishment of a national volunteer program to combat CSAM as the most promising policy to assist law enforcement. A national program ensures all law enforcement agencies the ability to use the services of skilled volunteers regardless of their location and resources. Members of the public are seeking ways to assist law enforcement to combat CSAM by dedicating their time, resources and skills. A national volunteer program would serve the dual purpose of helping law enforcement fill gaps in investigative needs while creating meaningful opportunities for civilians to contribute to the fight against child sexual exploitation.

⁵ Ross Wolf, Stephen T. Holmes, and Carol Jones, "Utilization and Satisfaction of Volunteer Law Enforcement Officers in the Office of the American Sheriff: An Exploratory Nationwide Study," *Police Practice and Research* 17, no. 5 (2016): 451, <https://doi.org/10.1080/15614263.2015.1031750>.

ACKNOWLEDGMENTS

First and foremost, thank you to my incredible friends and fellow 1905/1906 cohort members. I learned so much from all of you, laughed way too much in class, and enjoyed every moment I got to sit and chat with all of you. My biggest regret is a pandemic denying us the opportunity to sit and share more stories and to learn from and about one of the most fascinating, thoughtful, and wonderful group of people I've ever had the honor of meeting. Your constant check-ins, sharing of stories, and friendship means more to me than you will ever know.

I'll be sitting front row at each of your TED talks—just send me the dates, and if you are feeling generous maybe some free tickets? I work for state government and those tickets aren't cheap.

I cannot thank my two advisors, Dr. Erik Dahl and Dr. Christopher Bellavita, enough for their guidance, wisdom and everything it took to get me to the finish line. To Noel, without you I probably would have burned my computer and moved to a tent community in the Keys because I wouldn't have made it past the proposal stage without your help. To the many others who helped me along the way, Greta, Marianne, Eric, Kyle, Craig, Cheryldee and Shannon, I'm so grateful for your willingness to spend your time and expertise to help me immeasurably along the way.

Finally, I can't thank my incredible family and friends enough for their love, patience and support during these past 18 months. To my amazing kids, if I can give you one piece of advice, go into the sciences—it pays better and you won't have to write a thesis.

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I. INTRODUCTION

A. PROBLEM STATEMENT

The online transmission of child sexual abuse material and other cyber sexual crimes, such as sextortion, grooming, and live streaming of child sexual abuse, has exploded in recent years, and law enforcement does not have the resources to stop it. Child sexual abuse material exists across every facet of the internet without consequence and leads to new sexual offenses being committed. Online communities of sexual predators are creating new and more sadistic images of child sexual abuse, leading to new victims being hunted and groomed for the purpose of recording the acts and disseminating them online.¹ The volume of child sexual abuse material reported to law enforcement is staggering. In 1998, 3,000 images of child sexual abuse were reported, but by 2014, the reported images exceeded one million.² In 2019, the National Center for Missing and Exploited Children (NCMEC) received approximately 16.9 million reports comprising 69.1 million images, videos, and files.³ The number of images has exceeded law enforcement's current capacity to review and investigate such cases.

Time is of the essence in child sexual abuse investigations.⁴ While these images capture the horrific abuse of a child, they can also lead to the identification and rescue of sexual abuse victims who are unable to seek help on their own. Each day that passes without the victim being rescued can lead to more sexual abuse. If a child is moved from the original location where the image was created to a new location, it diminishes the likelihood of locating the victim and offender. Investigations into online child sexual abuse

¹ U.S. Sentencing Commission, *Federal Child Pornography Offenses* (Washington, DC: U.S. Sentencing Commission, 2012), 98–99, https://www.ussc.gov/sites/default/files/pdf/news/congressional-testimony-and-reports/sex-offense-topics/201212-federal-child-pornography-offenses/Full_Report_to_Congress.pdf.

² Michael H. Keller and Gabriel J. X. Dance, “The Internet Is Overrun with Images of Child Sexual Abuse. What Went Wrong?,” *New York Times*, September 28, 2019, <https://www.nytimes.com/interactive/2019/09/28/us/child-sex-abuse.html?smid=nytcore-ios-share>.

³ National Center for Missing and Exploited Children, “About NCMEC.”

⁴ Susan Hennessey, *The Elephant in the Room: Addressing Child Exploitation and Going Dark*, Aegis Paper Series No. 1701 (Stanford, CA: Hoover Institution, 2017), 29, https://www.hoover.org/sites/default/files/research/docs/hennessey_webreadypdf.pdf.

are extremely complex and require a great deal of time and resources to analyze a single image.⁵ These intricate investigations, coupled with high volume and too few specialists to investigate, create tremendous backlogs of evidence needing to be reviewed.⁶ Investigations into online child sexual abuse offenses require extensive advanced training.⁷ Moreover, budget limitations restrict the number of full-time staff agencies may hire. Law enforcement officers who investigate online child sexual abuse materials note that their main challenges are the quantity of evidence needing to be examined and the lack of funding and staffing needed to accomplish this task.⁸

Although law enforcement uses automated tools for some of the investigative process, trained individuals still need to review the files.⁹ Certain aspects of investigations into images are significantly time consuming but do not necessarily require a sworn law enforcement officer. These include investigating images and items found in the background of sexual abuse material through reverse image searches; open-source intelligence (OSINT) investigative techniques; or extraction of digital evidence such as email addresses, internet identifiers, or other relevant details.¹⁰ On average, it takes approximately one hour to conduct an open-source intelligence investigation for each clue found in an image.¹¹ Compounding the time required for someone investigating one image against the millions of images located is the need for more trained individuals looking at these images to assist in the investigative process.

While more individuals are needed to investigate these images, hiring more personnel requires additional funding. Even if the funding were increased for hiring, it may not be spread equally among all agencies across the country. Additionally, although

⁵ Hitchcock, Le-Khac, and Scanlon, “Tiered Forensic Methodology”; and U.S. Department of Homeland Security, *Strategy to Combat Human Trafficking*, 18.

⁶ Hitchcock, Le-Khac, and Scanlon, “Tiered Forensic Methodology,” 1.

⁷ U.S. Department of Homeland Security, *Strategy to Combat Human Trafficking*, 18.

⁸ Goodison, Davis, and Jackson, *Digital Evidence and the U.S. Criminal Justice System*, 1.

⁹ Goodison, Davis, and Jackson, 6.

¹⁰ Kemal Veli Açar, “OSINT by Crowdsourcing: A Theoretical Model for Online Child Abuse Investigations,” *International Journal of Cyber Criminology* 12, no. 1 (June 2018): 207, <https://doi.org/10.5281/zenodo.1467897>.

¹¹ Açar, 207.

increasing the number of full-time personnel to assist in these images would increase the number of images investigated, the amount of work one individual can accomplish has its limits, and budgetary limitations cannot be scaled above what funding is allocated. Incorporating trained volunteers to assist in OSINT investigations or extract digital evidence may provide a way to increase the number of individuals reviewing images without the budgetary and resource limitations of hiring full-time employees. However, no model or policy exists for incorporating trained volunteers to assist in the investigations of these images. Without new, comprehensive strategies to increase the number of images properly investigated, the number of images will continue to multiply, offenders will commit further offenses, and children will remain in danger.

B. RESEARCH QUESTION

What are the advantages and disadvantages of using citizen volunteers to help investigate child sexual abuse material?

C. LITERATURE REVIEW

Citizens have been assisting law enforcement since the establishment of organized police agencies.¹² The roles in which volunteers have served to assist law enforcement throughout history has come in many different forms, but each role has empowered citizens to prevent the problems that lead to crime or assist law enforcement in solving crimes.¹³ Literature on modern volunteer police programs is limited due to the lack of uniformity in the type of duties assigned to volunteers and the structure used to recruit, train, and retain them. Nevertheless, the literature is replete with examples of how volunteers benefit law enforcement agencies and the community. This literature review demonstrates ways in which volunteer police forces are used to assist law enforcement in the performance of their duties, as well as the reported benefits and perceived drawbacks of incorporating volunteers.

¹² Adam Dobrin, "Volunteer Police: History, Benefits, Costs and Current Descriptions," *Security Journal* 30, no. 3 (July 2017): 1, <https://doi.org/10.1057/sj.2015.18>.

¹³ Jose Docobo, "Community Policing as the Primary Prevention Strategy for Homeland Security at the Local Law Enforcement Level," *Homeland Security Affairs* 1, no. 1 (Summer 2005): 1, <https://www.hsaj.org/articles/183>.

1. Volunteer Police Forces

While volunteers greatly contribute to the missions of law enforcement agencies across the country, the ability of researchers to compile basic information on law enforcement volunteers is fraught with limitations.¹⁴ Many states do not track how many volunteers are serving with law enforcement agencies or in what capacity they serve.¹⁵ In a 2017 nationwide study, researcher Adam Dobrin surveyed state agencies to determine their number of volunteer police and evaluate effective policies and practices.¹⁶ In aggregating the state data, Dobrin found limited tracking of volunteers and a wide disparity in how they were hired, trained, and utilized per state.¹⁷ For example, Dobrin found that out of the 50 states and District of the Columbia, 21 states had no way of tracking statewide volunteers, and 11 states had zero volunteers or did not allow volunteers.¹⁸

Law enforcement's use of volunteers has become such an essential part of many agencies that the Bureau of Justice Assistance (BJA) under the Department of Justice released a guide for establishing or enhancing a volunteer program.¹⁹ The BJA cites many benefits of volunteer programs including maximizing resources, providing a substantial return on investment, enhancing public safety and services, improving community buy-in, allowing citizens to learn about law enforcement, and serving as a law enforcement recruitment tool.²⁰

In his book on law enforcement volunteers, Martin Alan Greenberg analyzes the development and status of the auxiliary police movement in one New York City

¹⁴ Ron Malega and Joel H. Garner, "Sworn Volunteers in American Policing, 1999 to 2013," *Police Quarterly* 22, no. 1 (2019): 58, <https://doi.org/10.1177/1098611118785168>.

¹⁵ Adam Dobrin, "State-Level Estimates of the Number of Volunteer Police in the United States," *International Journal of Police Science & Management* 19, no. 2 (2017): 81–88, <https://doi.org/10.1177/1461355717695322>.

¹⁶ Dobrin, 81.

¹⁷ Dobrin, 82–83, 87.

¹⁸ Dobrin, 83–87.

¹⁹ Bureau of Justice Statistics, *Volunteer Programs: Enhancing Public Safety by Leveraging Resources* (Washington, DC: Bureau of Justice Statistics, 2010), https://bja.ojp.gov/sites/g/files/xyckuh186/files/Publications/IACP_VIPS_ResourceGuide.pdf.

²⁰ Bureau of Justice Statistics, "Volunteer Programs," 1–2.

community.²¹ Greenberg's work promotes a list of ways a "carefully screened and trained auxiliary police unit should help police departments."²² Among the most relevant uses for auxiliary police, he highlights trained and available personnel for times of emergency or extra assignments; recruitment of qualified police candidates; and the unlimited potential for volunteers to combat certain roots of criminal acts through a wide range of social services.²³ He also cites benefits for volunteers such as providing them with a sense of self-worth by using their time and skills to contribute to a more unified community, as well as an alternative to vigilantism by creating a program or platform for citizens to help their community or curb crime.²⁴ In compiling these potential benefits, Greenberg demonstrates ways in which the value of volunteer police programs can be measured. Measurements include how volunteers affect communities in crime prevention and reporting or how volunteering affects an individual's decision to join the police or increase civic engagement. However, as researchers such as Dobrin note, limited research and data exist on the realized benefits of volunteer police programs nationally due to limitations in collecting data.²⁵

2. Benefits of Law Enforcement Volunteers

One of the most recognized reasons agencies seek volunteers is a lack of fiscal or other resources required to accomplish the goals of the agency and meet the needs of the community.²⁶ Volunteers with police agencies enhance police functions to deter and solve

²¹ Martin Alan Greenberg, *Auxiliary Police: The Citizen's Approach to Public Safety* (Westport, CT: Greenwood Press, 1984).

²² Greenberg, *Auxiliary Police*, 165.

²³ Greenberg, *Auxiliary Police*, 165; Adam Dobrin, "Volunteer Police: History, Benefits, Costs and Current Descriptions," *Security Journal* 30, no. 3 (July 2017): 721–22, <https://doi.org/10.1057/sj.2015.18>.

²⁴ Greenberg, *Auxiliary Police*, 165.

²⁵ Dobrin, "State-Level Estimates." :87

²⁶ Wolf, Holmes, and Jones, "Utilization and Satisfaction of Volunteer Law Enforcement," 451.

crimes while simultaneously compensating for limited resources and offsetting costs.²⁷ In 2019, the national median salary for a police or sheriff's officer was \$67,600 per year, or \$32.50 per hour.²⁸ Volunteers, many of whom possess specialized skill sets and training, on average serve eight to 16 hours per month but often more.²⁹ Dobrin found police agencies that used volunteers report saving hundreds of thousands to millions of dollars each year.³⁰ Further research by James Larson et al. demonstrates agencies can also maximize resources by using volunteers to do certain tasks, which enables "highly trained officers to do tasks that require their expertise."³¹ Thus, by tasking volunteers with time-consuming or less-technical responsibilities, officers are free to focus on the highly specialized aspects of investigations.

Volunteer police services can provide significant cost savings, but as researchers Ross Wolf, Stephen Holmes, and Carol Jones demonstrate, they are not free.³² The costs associated with each volunteer varies depending on the duties and expectations assigned; still, agencies can expect to pay for recruitment, training, background checks, and equipment, not to mention workplace expenses such as workman's compensation and other insurance costs.³³ Full-time staff will need to expend time and resources training, managing, coordinating, and overseeing volunteers.³⁴ However, based on the wide range

²⁷ Ling Ren et al., "Participation Community Crime Prevention: Who Volunteers for Police Work?," *Policing: An International Journal* 29, no. 3 (2006): 465, <https://doi.org/10.1108/13639510610684700>; and Susan M. Hilal and David Olson, "Police Reserve Officers: Essential in Today's Economy and an Opportunity to Increase Diversity in the Law Enforcement Profession," *Police Chief Magazine*, October 1, 2010, <https://www.policechiefmagazine.org/police-reserve-officers-essential-in-todays-economy-and-an-opportunity-to-increase-diversity-in-the-law-enforcement-profession/>.

²⁸ U.S. Bureau of Labor Statistics, "Occupational Employment and Wages: 33-3051 Police and Sheriff's Patrol Officers," Occupational Employment Statistics, May 2019, <https://www.bls.gov/oes/current/oes333051.htm>.

²⁹ Dobrin, "Volunteer Police," 720; and Wolf, Holmes, and Jones, "Utilization and Satisfaction of Volunteer Law Enforcement," 451.

³⁰ Dobrin, "Volunteer Police," 720.

³¹ James Larson et al., "Reducing the Cost of Crime through Reserve Police Officers and Volunteer Citizen Patrol," *Research in Business and Economics Journal* 3 (July 2011): 6, <https://www.aabri.com/manuscripts/09316.pdf>.

³² Wolf, Holmes, and Jones, "Utilization and Satisfaction of Volunteer Law Enforcement," 451.

³³ Dobrin, "Volunteer Police," 725.

³⁴ Wolf, Holmes, and Jones, "Utilization and Satisfaction of Volunteer Law Enforcement," 451.

of tasks and skills in which volunteers can assist agencies, each agency must weigh costs and benefits to determine the return on investment for a volunteer program.

Even with the cited cost savings, limited data exists to determine how volunteer participation affects policing outcomes on a wider scale.³⁵ In 2015, researcher Seong Kang sought to measure the relationship between volunteer officers and organizational performance.³⁶ After collecting data and surveying more than 16,000 police agencies that employ volunteer officers, she found that an increase in volunteers positively affects the clearing of violent crimes. However, departments must employ large numbers of volunteers to match the same output a full time officer provides.³⁷ Opinions among agencies vary on whether the benefits of volunteer police programs outweigh the negatives. Each law enforcement agency that employs volunteers creates its own program with varying degrees of prescribed training, duties, and objectives.³⁸

Some studies have shown that volunteers improve police–community relations. In 2010, researchers Gravelle and Rogers looked at structuring policing in a way that would increase community involvement in police actions.³⁹ Their research suggests a community’s lack of awareness and engagement increases crime and leads to legitimacy concerns over the authority and effectiveness of police.⁴⁰ These concerns over police effectiveness are magnified during times of economic hardship when budgetary constraints prevent law enforcement agencies from addressing all the problems in their communities.⁴¹ By promoting formalized volunteer programs, the police empower and mobilize the public to operate in a mutually productive partnership.⁴² Although the study was conducted during

³⁵ Dobrin, “State-Level Estimates,” 87.

³⁶ Seong C. Kang, “Volunteer Involvement and Organizational Performance: The Use of Volunteer Officers in Public Safety,” *Public Performance & Management Review* 42, no. 3 (2019): 554–79, <https://doi.org/10.1080/15309576.2018.1483830>.

³⁷ Kang, “Volunteer Involvement and Organizational Performance,” 560

³⁸ Dobrin, “State-Level Estimates,” 83–87.

³⁹ Colin Rogers and James Gravelle, “UK Policing and Change: Reflections for Policing Worldwide,” *Review of European Studies* 4, no. 1 (March 2012): 42–51, <https://doi.org/10.5539/res.v4n1p42>.

⁴⁰ Rogers and Gravelle, 44.

⁴¹ Rogers and Gravelle, 49.

⁴² Rogers and Gravelle, 48.

a financial crisis when resources were limited, the scheme developed by the researchers suggests that developing long-term volunteer programs would better the community as well as decrease crime and the public's fear of crime.⁴³

The research demonstrates volunteer police forces can be beneficial to agencies by enhancing resources and offsetting costs. Research also demonstrates citizens benefit from police volunteer programs by assisting in clearing violent crimes, improving police and community relationships, and empowering the public to serve their communities.

3. Drawbacks to Volunteer Programs

Through their study, Gravelle and Rogers noted several disincentives to establishing a long-term volunteer program.⁴⁴ First, the researchers recognized that programs may require additional oversight for potential issues in areas such as data security, employment matters, and volunteer safety.⁴⁵ Volunteers working through police agencies are subject to the same workplace condition protections as paid personnel. Additionally, law enforcement agencies house highly confidential and sensitive information. If volunteers gain access to this information, the agency could be held responsible if the sensitive information were released or if volunteers use the information inappropriately.

The cost of operating a volunteer program requires substantial financial expenditures for recruitment, training, retention, and volunteer welfare.⁴⁶ Additional potential costs include the salary and benefits of the volunteer coordinator, work space, supplies, and equipment.⁴⁷ Moreover, according to the authors, police officers and agencies may refuse to accept the idea of allowing volunteers to take on more active roles. This

⁴³ Rogers and Gravelle, 48.

⁴⁴ Rogers and Gravelle, "UK Policing and Change."

⁴⁵ Rogers and Gravelle, 48.

⁴⁶ Rogers and Gravelle, 48.

⁴⁷ Volunteers in Police Services, *Volunteers in Police Services Add Value While Budgets Decrease* (Alexandria, VA: Volunteers in Police Service Program, 2011), 5, https://www.theiacp.org/sites/default/files/2018-09/VIPS_police_service_add_value_while_budgets_decrease.pdf.

finding also appeared in Greenberg's 1984 study, in which he found the fate and success of a volunteer force is inexorably tied to the personal beliefs and desires of those in power, as well as the attitudes of the police within the agency and their unions.⁴⁸ Therefore, understanding the mindset of police "culture" and identifying areas of resistance to volunteers are essential before crafting a volunteer program.⁴⁹

This idea of law enforcement officers not finding value in volunteer police forces was explored in a 2012 study on civilian volunteer efforts to curb cybercrime. During the study, researchers Huey, Nhan, and Broll explored the roles with which citizens may assist law enforcement in policing internet crimes. The researchers concluded that collectives of online civilians who track criminal offenders on the internet are an undervalued component of cyber security.⁵⁰ Despite the potential value of civilians in cyber investigations, further research has shown a wide range of detractors to using volunteers.⁵¹ During interviews with the researchers, police detectives expressed concern over legal liability, the lack of belief in civilian contributions, impacts to case integrity, dangers to civilians, and potential constitutional violations.⁵² However, despite successful police–public partnerships to stop or solve crime, the author notes that mistrust of civilian efforts as well as "police subculture" remain the major impediments to civilians being accepted by police to assist in cyber cases.⁵³

Other studies have highlighted the role of police supervisors' attitudes toward the use of volunteers as a key area of research, as supervisors are integral to the implementation of policies or programs.⁵⁴ Studies have found police cultures that value aggressive

⁴⁸ Greenberg, *Auxiliary Police*, 165.

⁴⁹ Scott W. Phillips and Amanda Terrell-Orr, "Attitudes of Police Supervisors: Do Volunteers Fit into Policing?," *Policing: An International Journal of Police Strategies & Management* 36, no. 4 (2013): 685, <https://doi.org/10.1108/PIJPSM-10-2012-0102>.

⁵⁰ Laura Huey, Johnny Nhan, and Ryan Broll, "'Uppity Civilians' and 'Cyber-Vigilantes': The Role of the General Public in Policing Cyber-Crime," *Criminology & Criminal Justice* 13, no. 1 (2013): 81–97, <https://doi.org/10.1177/1748895812448086>.

⁵¹ Huey, Nhan, and Broll, 92.

⁵² Huey, Nhan, and Broll, 93–95.

⁵³ Huey, Nhan, and Broll, 94–95.

⁵⁴ Phillips and Terrell-Orr, "Attitudes of Police Supervisors," 684.

approaches to crime fighting are “resistant to change” and naturally “suspicious of outsiders.”⁵⁵ Researchers Scott Phillips and Amanda Terrel-Orr developed a survey to test the hypothesis “that police supervisors who expect aggressive law enforcement norms would tend to resist volunteers in policing.”⁵⁶ For their 2013 study, Phillips and Terrel-Orr surveyed police supervisors from various agencies to gauge their attitudes toward volunteers in policing.⁵⁷ They found, “volunteers are accepted in police culture when the respondent has more experience as a supervisor.”⁵⁸

Other key factors that positively affect the perception of volunteers include previously using volunteers, employing a significant number of volunteers at the agency, and having a well-established program at an agency.⁵⁹ In other words, familiarity with and exposure to volunteer programs is an important factor in the level of resistance to volunteers as the increased use of volunteers leads to greater acceptance.⁶⁰ Moreover, supervisors whose agencies use volunteers see them as making valuable contributions, contradicting the belief “that volunteers are more trouble than they are worth.”⁶¹ The research demonstrated the downsides to volunteer programs. First, starting and maintaining a volunteer program incurs substantial costs. Volunteers are entitled to certain workplace protections that could open an agency up to liability. Further, if leadership or officers within an agency were not vested in using volunteers, the value of the volunteer program would not be realized.

4. Conclusion

In order to fully study the advantages and disadvantages of using volunteers in combatting child sexual abuse material, investigating what is known about police volunteer programs generally would be valuable. The literature reveals that law enforcement relies

⁵⁵ Phillips and Terrell-Orr, 695.

⁵⁶ Phillips and Terrell-Orr, 687.

⁵⁷ Phillips and Terrell-Orr, 688.

⁵⁸ Phillips and Terrell-Orr, 691.

⁵⁹ Phillips and Terrell-Orr, 691.

⁶⁰ Phillips and Terrell-Orr, 696.

⁶¹ Phillips and Terrell-Orr, 695.

on volunteers to help fill needs when resource and personnel limitations prevent agencies from doing all that is needed to keep their communities safe and secure. In addition to cost savings, citizen volunteers increase awareness of particular crimes and offenses, foster relationships between law enforcement and the community, and may help reduce crime or increase reporting of particular crimes. These are all important aspects needed to combat child sexual abuse and online sexual crimes against children. However, the substantial costs of a volunteer program requires significant buy in from leadership and the agency as a whole for the value of the program to be realized. If officers are distrustful of volunteers or see them as a liability rather than an asset, it renders the volunteer program ineffective.

Incorporating volunteers into cases of online sexual abuse of children could assist law enforcement in investigating these crimes, as well as increase reporting and awareness of these offenses. Additionally, fostering relationships with law enforcement and the community may assist victims in reporting crimes. The literature review explored the benefits and disadvantages of police volunteer programs in general. This thesis seeks to explore the advantages and disadvantages of volunteers as it pertains specifically to investigating, combatting, and solving child sexual abuse material offenses.

D. SIGNIFICANCE

Law enforcement locating CSAM (Child Sexual Abuse Material) and identifying the victim and offender represents a key aspect of combating the sexual abuse of children. Vast numbers of victims are often unable or unwilling to report the abuse, but the images are visual depictions of crime scenes and documented evidence of abuse of children.⁶² Law enforcement uses the images to rescue children who may not be able to come forward and arrest offenders thus holding them accountable for past abuse and stopping future sexual abuse.⁶³

⁶² Nicholas Scurich and Richard S. John, *The Dark Figure of Sexual Recidivism*, Legal Studies Research Paper Series No. 2019-09 (Irvine, CA: UC Irvine School of Law, 2019), 4, <https://papers.ssrn.com/abstract=3328831>; and Michael Planty et al., *Female Victims of Sexual Violence, 1994-2010* (Washington, DC: Bureau of Justice Statistics, 2016), 7, <https://www.bjs.gov/content/pub/pdf/fvsv9410.pdf>.

⁶³ Michael L. Bourke, Derek Prestridge, and Melanie B. Malterer, "Interdiction for the Protection of Children: Preventing Sexual Exploitation One Traffic Stop at a Time," *Aggression and Violent Behavior* 30 (September 2016): 70, <https://doi.org/10.1016/j.avb.2016.07.009>.

The literature on sexual abuse crimes demonstrates these offenses are highly underreported.⁶⁴ Many victims are unable to testify due to age or incapacitation, but others are unable or unwilling due to fear, shame, or inability.⁶⁵ Grooming tactics and methods to silence victims of sexual abuse are well known by experts, and social media platforms have allowed sexual abusers easy access to victims and the ability to groom them into sexual contact or self-producing child sexual abuse material.⁶⁶ Offenders use many different manipulative tactics through social media platforms to achieve their objectives.⁶⁷ For victims of child sexual abuse material, the images can be a powerful deterrent to disclosing their abuse.⁶⁸

In a 2017 survey by the Canadian Center for Child Protection, survivors of sexual abuse were asked about the role of sexual imagery in their abuse.⁶⁹ Most survivors (68 percent) reported that imagery was not found at the time the abuse was uncovered, but 85 percent of survivors indicated imagery of their abuse was uncovered at some point in their life.⁷⁰ Fifty-three percent of respondents indicated the existence of the imagery impacted their decision to stay silent citing fear and shame as the two biggest reasons.⁷¹ Thus victims are often forced to continue self-producing or being used in the creation of new images for dissemination on the internet. Law enforcement therefore must use investigate techniques

⁶⁴ Scurich and John, *The Dark Figure of Sexual Recidivism*, 4; and Planty et al., *Female Victims of Sexual Violence, 1994-2010*, 7.

⁶⁵ Bourke, Prestridge, and Malterer, "Interdiction for the Protection of Children," 69–70.

⁶⁶ U.S. Department of Justice, *The National Strategy for Child Exploitation Prevention and Interdiction: A Report to Congress* (Washington, DC: Department of Justice, 2010), 1, 29, Appendix C-4, <https://www.hsd1.org/?view&did=20763>.

⁶⁷ National Center for Missing & Exploited Children, "Trends Identified in CyberTipline Sextortion Reports" (Alexandria, VA: National Center for Missing & Exploited Children, 2016), <https://www.missingkids.org/content/dam/missingkids/pdfs/ncmec-analysis/sextortionfactsheet.pdf>. NCMEC reports the three primary objectives of sextortion are: acquire more sexual content of the child (78%); obtain money or goods from the child (7%); and to engage in sexual activity with the child (5%).

⁶⁸ Canadian Centre for Child Protection, *Survivors' Survey: Executive Summary 2017* (Winnipeg, Canada: Canadian Centre for Child Protection, 2017), 25, https://protectchildren.ca/pdfs/C3P_SurvivorsSurveyExecutiveSummary2017_en.pdf.

⁶⁹ Canadian Centre for Child Protection, 25.

⁷⁰ Canadian Centre for Child Protection, 25.

⁷¹ Canadian Centre for Child Protection, 26.

to identify victims as they are unwilling or unable to come forward, which takes tremendous time, effort, and resources.

This thesis explores the advantages and disadvantages of using volunteers in assisting investigating CSAM. Reviewing the different policies or techniques law enforcement employ to combat CSAM will assist policy makers in determining whether volunteers would positively or negatively impact law enforcement's ability to decrease the time it takes to investigate an image while also increasing the number of victims rescued and offenders arrested. Although more people assisting in these investigations could lead to more images being analyzed or located, volunteer programs could lead to wasted time or resources if they are diverted away from law enforcement to fund ineffective volunteer programs. Additionally, studying volunteer impacts by demonstrating whether they can be leveraged to create awareness across the nation of the prevalence of the issue of CSAM is vital. This awareness could inspire community efforts to assist or increase vigilance by parents, guardians, and children as well.

E. RESEARCH DESIGN

Using policy analysis, this thesis evaluates the current policies in place to analyze the advantages and disadvantages of citizen volunteers to help investigate child sexual abuse material using Eugene Bardach and Eric M. Patashnik's "eightfold path."⁷² More specifically, this research will incorporate data obtained through NCMEC, as well as Internet Crimes against Children (ICAC) centers, to demonstrate the volume of offenses and methods used to investigate the images. Additionally, research and published surveys from ICAC agents discussing their most prevalent challenges highlights the deficiencies in law enforcement's ability to combat the creation and dissemination of child sexual abuse material. These data points are necessary to determine whether, and in what capacity, volunteers could be used.

Next, data and research regarding established law enforcement volunteer programs illustrates the benefits and disadvantages of established law enforcement programs.

⁷² Eugene Bardach and Eric Patashnik, *A Practical Guide for Policy Analysis*, 6th ed. (Washington, DC: CQ Press, 2020).

Historically, some law enforcement agencies have looked to volunteers to solve pressing community issues. While the literature reveals limited research on national volunteer programs, studies exist regarding specific agencies and their use of volunteers. Comparing the research of specific volunteer programs against the current needs of law enforcement in the fight against CSAM, could serve to highlight analogous benefits and disadvantages of volunteers.

Several law enforcement agencies seek assistance from the public through informal crowdsourcing methods. For example, the Federal Bureau of Investigation (FBI) and NCMEC rely on the public to assist in investigations by posting open calls for information to their website. Through the Endangered Child Alert Program (ECAP), the FBI releases images of items located in the background of CSAM or images of the offender to seek tips from the public.⁷³ The ECAP program has led to the rescue of over 40 children and identification of 26 previously unidentified offenders.⁷⁴ In a collaborative initiative between the FBI, NCMEC, and others, Operation Rescue Me searches for clues contained in CSAM and seeks the assistance of the public when traditional investigative methods are exhausted.⁷⁵ Private citizen groups and organizations have formed to create a more collaborative effort to assist law enforcement agencies with open-source investigations into publically released images. Many of these groups are recognized by law enforcement as providing key information leading to the rescue of victims as well as the identification of locations and offenders. Data from law enforcement agencies regarding the number of tips received can be used to show value in incorporating the public, as well as potential inefficiencies in using open-crowd sourcing.

After analyzing the evidence, the next step is to determine whether alternative strategies to the current policies are needed.⁷⁶ I hypothesize that different policy options incorporating volunteers would assist law enforcement agencies in combatting CSAM. If

⁷³ “Crimes against Children: Help Us Identify a Child Predator,” Federal Bureau of Investigation, October 11, 2017, <https://www.fbi.gov/news/stories/help-identify-child-predator-jane-doe-39>.

⁷⁴ Federal Bureau of Investigation.

⁷⁵ U.S. Department of Justice, *The National Strategy for Child Exploitation Prevention and Interdiction*, 1, 29.

⁷⁶ Bardach and Patashnik, *A Practical Guide for Policy Analysis*, 21.

alternative solutions prove effective, two to three solutions based on the evidence analyzed and other known models will be discussed. The proposed criteria for evaluating the approaches encompass the following:

- Efficiency: Is the policy an efficient method of pursuing the objectives of investigating the clues in each image by increasing the number of images investigated or decreasing the time it takes to review images?
- Opportunity to gain intelligence: Does the policy enable investigators to gain intelligence needed to achieve the most important premised objectives.
- Cost: What are the financial costs or savings associated with the policy?
- Implementation: What are the difficulties and benefits in implementing the policy?
- Congressional support: Are the policies politically supported to receive the proper funding and resources?

After assessing potential alternatives through the evaluative criteria, potential outcomes of each policy will be discussed.⁷⁷ Following a review of realistic outcomes of the alternative policies, the thesis presents the tradeoffs of the policies against the criteria.⁷⁸ The next step will be synthesizing all elements of the research design to discuss the feasibility of implementing a new policy. Finally, the policy options will be ranked and a single policy option recommended for maximum effectiveness.

F. ROADMAP

Chapter I highlights the problems facing law enforcement today in fighting CSAM and the significance of finding new ways to combat and investigate these horrific images. Chapter I also lays out the research question, provides an overview of law enforcement

⁷⁷ Bardach and Patashnik, *A Practical Guide for Policy Analysis*, 49.

⁷⁸ Bardach and Patashnik, *A Practical Guide for Policy Analysis*, 69.

volunteer programs, and discusses policy options analysis as the method of studying the research question. Chapter II explores the background and greatest challenges for law enforcement in CSAM investigations by identifying the greatest gaps in law enforcement resources and areas in which volunteers may be used to assist or help close those gaps. After identifying the biggest challenges, Chapter III demonstrates examples of how the public is currently assisting law enforcement through crowdsourcing and volunteer efforts. Crowdsourcing allows a citizen to decide how in and what capacity they may assist, while a structured volunteer program requires volunteers to commit to specified hours to complete specific tasks designed to supplement police resources, not replace them. By seeing how law enforcement currently uses public engagement, policy makers can weigh known advantages and disadvantages to better formulate plans for developing future opportunities to assist in law enforcement's current and projected needs

Chapter IV seeks to evaluate the effectiveness of the current United States policy on incorporating the public to combat CSAM. Constructing alternatives, establishing criteria, and evaluating policy options allow such evaluation.⁷⁹ Once the alternatives are developed, they are measured against the established criteria.⁸⁰ Chapter V discusses the outcome recommendation for the most effective option.

⁷⁹ Bardach and Patashnik, 21, 31.

⁸⁰ Bardach and Patashnik, 69, 71.

II. BACKGROUND INTO CHILD SEXUAL ABUSE MATERIAL INVESTIGATIONS

Child sexual abuse material (CSAM) investigations are often complex and time consuming. Many factors contribute to the incredible difficulty of CSAM investigations. The immense volume of images law enforcement must investigate represents one of the most pressing issues. Despite technology advances in recent years, law enforcement heavily relies on human intelligence and advanced investigative skills to complete investigations of the imagery. Although each image must be fully investigated, it takes a great amount time and resources. This chapter explores some of the biggest challenges law enforcement encounters during online CSAM investigations to identify gaps that volunteers might fill. Likewise, this chapter overviews the use of crowdsourcing by law enforcement as a tool in investigations, while also discussing the downsides of using public assistance to develop leads. By providing a background on current challenges, policy makers will understand key investigative challenges and potential solutions.

A. DIFFICULTY IN CHILD SEXUAL ABUSE INVESTIGATIONS

Some of the greatest challenges to law enforcement in the investigation of CSAM is the tremendous volume of images and the length of time needed to conduct full investigations into the images. The internet is seething with disturbing images, but officers often lack the ability to locate the images online or track the offenders trading, disseminating, or live streaming CSAM. The following section provides a background into the monumental tasks facing law enforcement.

1. Volume and Time

High volumes of child sexual imagery without sufficient staff to conduct the investigations into the images rank as one of the most commonly cited hindrances in combatting online child sexual abuse.⁸¹ The quantity of imagery has made it impossible to

⁸¹ Goodison, Davis, and Jackson, "Digital Evidence and the U.S. Criminal Justice System," 22.

fully and properly investigate all the images detected creating backlogs.⁸² Smaller agencies that lack the same funding and technology to assist in the investigation of the images particularly struggle with the workload.⁸³ The cases far exceed the number of staff needed to work them, thus necessitating triaging cases by prioritizing images with the youngest victims or worst acts of torture.⁸⁴ Besides the psychological trauma such images can inflict on a law enforcement officer, the long hours needed to analyze each image takes a tremendous toll.⁸⁵ Investigators who specialize in investigating CSAM often experience burn-out due to work overload.⁸⁶

The inability to investigate every image is especially alarming based on the documented evidence that the images can lead to the discovery of victims who are unable to come forward.⁸⁷ Sexual crimes are vastly underreported, especially offenses against children who are often unable to report or are unable to comprehend they are being sexually abused due to factors such as age or mental or physical incapacitation. Studies show and investigations demonstrate that offenders of child sexual abuse material have abused children in the past, are currently abusing children, or are broadcasting what they want to do in the future.⁸⁸ Every tip received must be investigated. However, due to limited time and manpower to review reported images in a timely way, cases quickly go stale and

⁸² R. Gregg Dwyer et al., *Protecting Children Online: Using Research-Based Algorithms to Prioritize Law Enforcement Internet Investigations, Technical Report* (Charleston, SC: Medical University of South Carolina, 2016), 5, <https://www.ncjrs.gov/pdffiles1/ojjdp/grants/250154.pdf>.

⁸³ Goodison, Davis, and Jackson, "Digital Evidence and the U.S. Criminal Justice System," 22

⁸⁴ Dwyer et al., *Protecting Children Online*, 5, 22.

⁸⁵ Lisa M. Perez et al., "Secondary Traumatic Stress and Burnout among Law Enforcement Investigators Exposed to Disturbing Media Images," *Journal of Police and Criminal Psychology* 25, no. 2 (October 2010): 113, <https://doi.org/10.1007/s11896-010-9066-7>; and Laura Sanchez et al., "A Practitioner Survey Exploring the Value of Forensic Tools, AI, Filtering, & Safer Presentation for Investigating Child Sexual Abuse Material (CSAM)," *Digital Investigation* 29, no. supplement (July 2019): S125, <https://doi.org/10.1016/j.diin.2019.04.005>.

⁸⁶ Meredith Krause, "Identifying and Managing Stress in Child Pornography and Child Exploitation Investigators," *Journal of Police and Criminal Psychology* 24, no. 1 (2009): 24, <https://doi.org/10.1007/s11896-008-9033-8>.

⁸⁷ Michael L. Bourke and Andres E. Hernandez, "The 'Butner Study' Redux: A Report of the Incidence of Hands-on Child Victimization by Child Pornography Offenders," *Journal of Family Violence; New York* 24, no. 3 (April 2009): 190, <https://doi.org/10.1007/s10896-008-9219-y>.

⁸⁸ Scurich and John, *The Dark Figure of Sexual Recidivism*, 4, 8.

evidence is lost.⁸⁹ The more dedicated individuals with the training and skills to assist in investigating these offenses will lead to faster response times, more arrests of offenders, and victims being identified and rescued.

2. Detection

One of the first hurdles law enforcement encounters is the detection of the images. The extent of CSAM transmitted online cannot be quantified due to the various avenues of distribution and transmission, many of which are difficult to detect. Estimates indicate only 1 percent of CSAM is known to law enforcement.⁹⁰ These images exist on almost every facet of the internet. Social media platforms are being leveraged by offenders of child sexual abuse material to trade, disseminate, and view images.⁹¹ Technology, software, and specific methodologies assist in locating some images online. Software developed by companies such as Google and Microsoft are used by many platforms to detect, remove, block, and report illegal and illicit images.⁹² Keyword searches are also another method used to locate images and videos. By searching common terms used by offenders of child sexual abuse material or a combination of keywords, researchers, and law enforcement can locate images and videos not detected by software.⁹³ This method is not automated and requires individuals to complete the keyword searches. Even with available technology

⁸⁹ Keller and Dance, “The Internet Is Overrun.”

⁹⁰ Bryce Garreth Westlake, “The Past, Present, and Future of Online Sexual Exploitation: Summarizing the Evolution of Production, Distribution, and Detection,” in *The Palgrave Handbook of International Cybercrime and Cyberdeviance*, ed. Thomas J. Holt and Adam M. Bossler (Cham, Switzerland: Palgrave Macmillan, 2019), 6, <https://doi.org/10.1007/978-3-319-90307-1>; and Brackett Foundation, Jeff Macdonald, and Clara Péron, *Artificial Intelligence: Combatting Online Sexual Abuse of Children* (Los Angeles: Bracket Capital, 2019), 13, <https://respect.international/wp-content/uploads/2019/11/AI-Combating-online-sexual-abuse-of-children-Bracket-Foundation-2019.pdf>.

⁹¹ Elie Bursztein et al., “Rethinking the Detection of Child Sexual Abuse Imagery on the Internet” (WWW ’19: The World Wide Web Conference, New York: Association for Computing Machinery, 2019), 1, <https://doi.org/10.1145/3308558.3313482>.

⁹² Bursztein et al., “Rethinking the Detection of Child Sexual Abuse Imagery on the Internet,” 1.

⁹³ Bryce Garreth Westlake, Martin Bouchard, and Richard Frank, “Comparing Methods for Detecting Child Exploitation Content Online” (2012 European Intelligence and Security Informatics Conference, Odense, Denmark: IEEE, 2012), 2–3, <https://doi.org/10.1109/EISIC.2012.25>.

continually scanning the internet and the manual efforts by law enforcement to locate images, an estimated 99 percent of CSAM uploaded online remains undetected.⁹⁴

Once law enforcement locates an image or video, the image itself as well as the persons involved in the transmission of the image must be investigated. The internet has created a heightened anonymity for criminals who perpetrate their crimes online.⁹⁵ This anonymity makes it particularly difficult to pinpoint the identity of those who are engaging in child sexual exploitation over the internet. Though law enforcement may use numerous techniques to locate the identity of offenders, they are incredibly time-consuming and the technology is costly, which many smaller agencies cannot afford.⁹⁶

Experts in cyber sexual crime investigations report the increasing difficulty and time-intensive nature investigations because of the explosion in the popularity of encryption software designed to protect an offender's anonymity.⁹⁷ Encryption affects many law enforcement investigations and the ability to retrieve images and evidence. Encryption is a legitimate and necessary tool for preventing crimes such as identity theft and financial crimes.⁹⁸ However, encryption has also made it more difficult for police to access digital evidence resulting in a backlog of cases, unidentified victims, and the potential for evidence to be destroyed or hidden.⁹⁹ Traditional methods of working with service providers or obtaining court orders do not result directly in data access so investigators often are left searching for assistance from outside vendors to access

⁹⁴ Brackett Foundation, Macdonald, and Péron, *Artificial Intelligence*, 13.

⁹⁵ Police Executive Research Forum, *New National Commitment Required: The Changing Nature of Crime and Criminal Investigations* (Washington, DC: Police Executive Research Forum, 2018), 17, <https://www.policeforum.org/assets/ChangingNatureofCrime.pdf>.

⁹⁶ Sophia Dastagir Vogt, "The Digital Underworld: Combating Crime on the Dark Web in the Modern Era," *Santa Clara Journal of International Law* 15, no. 1 (2017): 114–17, <https://digitalcommons.law.scu.edu/scujil/vol15/iss1/4>.

⁹⁷ Kimberly J. Mitchell and Dana Boyd, *Understanding the Role of Technology in the Commercial Sexual Exploitation of Children: The Perspective of Law Enforcement*. (Durham, NH: Crimes Against Children Research Center, 2014), 9, <https://scholars.unh.edu/ccrc/37>.

⁹⁸ Police Executive Research Forum, *New National Commitment Required*, 36–37.

⁹⁹ Police Executive Research Forum, 36–37.

encrypted data.¹⁰⁰ This process can be costly, time-consuming, unreliable, and may lead to evidentiary issues at trial.¹⁰¹

3. Live Streaming Child Sexual Abuse

On top of trading images, other online sexual offenses such as sextortion, solicitation of minors, and live child sex trafficking through webcams are becoming increasingly prevalent and difficult to track and stop.¹⁰² Webcam child sex trafficking is emerging as one of the more difficult trends to combat in child sexual abuse. Children are abused in real-time and viewers can log in to pay to watch children being sexually abused via webcam. It is also an emerging avenue for children to self-produce sexually explicit content or perform sexual acts via webcam for profit.¹⁰³

Webcam child sex trafficking is viewed internationally as a tremendous threat because it adds additional motivation for offenders to sexually abuse children. Traditionally child sexual abuse material is not monetized. Many child sexual abuse material offenders trade the material, but most do not seek financial compensation for their images.¹⁰⁴ However, traffickers can sexually abuse a child via webcam while hundreds of viewers pay to watch, thus creating a financial incentive to sexually abuse children.¹⁰⁵ Viewers may also pay to dictate certain acts be performed on a child, leading to the escalation of horrific abuse and torture on the child as it is live-streamed.¹⁰⁶ Because these acts occur in real-time, investigators need to continually check for these live feeds to attempt to locate the victim and offender, as well as the viewers. Some law enforcement

¹⁰⁰ Police Executive Research Forum, 40.

¹⁰¹ Police Executive Research Forum, 40.

¹⁰² “A Call to Action: Ending ‘Sextortion’ in the Digital Age,” Thomson Reuters Foundation, July 19, 2016, <http://www.trust.org/publications/i/?id=f3b8d35c-27bf-4ba7-9251-abc07d588347>.

¹⁰³ Westlake, “The Past, Present, and Future of Online Sexual Exploitation,” 20–21.

¹⁰⁴ U.S. Sentencing Commission, *Federal Child Pornography Offenses*, 76.

¹⁰⁵ Kemal Veli Açar, “Webcam Child Prostitution: An Exploration of Current and Future Methods of Detection,” *International Journal of Cyber Criminology* 11, no. 1 (April 2017): 99, <https://doi.org/10.5281/zenodo.495775>.

¹⁰⁶ Açar, 104.

agencies use proactive methods to track and locate viewers of webcam child sex trafficking. These investigations are extremely challenging and time consuming due to widespread methods used to hide an offender's location combined with the high numbers of those who log on to view children being sexually abused via webcam.¹⁰⁷

Investigations into live-stream sexual abuse requires tremendous coordination among nations as viewers log in from all around the world. If one law enforcement agency is made aware of the live stream and can determine the location of the acts, the agency must notify the requisite local agency in the jurisdiction where the abuse is taking place. Then, law enforcement agencies must begin to trace and locate the viewers. Once viewers are located, the agency in their jurisdiction must be notified as well.

This increased difficulty in unmasking the perpetrators also raises jurisdictional issues as it is often difficult to assess which agency would be in charge of “owning” the crime.¹⁰⁸ Child sexual abuse material can occur simultaneously in multiple jurisdictions. Live streams could be occurring overseas with individuals all over the world logging in to view and direct the acts committed against a child.¹⁰⁹ When a victim is being sextorted into self-producing child sexual abuse material, the victim could be located in one jurisdiction while the offender is in another.¹¹⁰ Given the highly complicated jurisdictional barriers, the response by law enforcement and child protection agencies to locate victims can be wrought with complications, lack of coordination, and inconsistent response.¹¹¹

B. THE HUMAN TOUCH

The many challenges discussed in CSAM investigations are compounded by the heavy dependence on individuals to conduct the investigations, and the inability to

¹⁰⁷ Açar, 102.

¹⁰⁸ Police Executive Research Forum, *New National Commitment Required*, 18.

¹⁰⁹ International Centre for Missing & Exploited Children, *Child Sexual Abuse Material: Model Legislation & Global Review*, 9th ed. (Alexandria, VA: International Centre for Missing & Exploited Children, 2018), 2, 25, <https://www.icmec.org/wp-content/uploads/2018/12/CSAM-Model-Law-9th-Ed-FINAL-12-3-18.pdf>.

¹¹⁰ Police Executive Research Forum, *New National Commitment Required*, 19.

¹¹¹ U.S. Department of Justice, *The National Strategy for Child Exploitation Prevention and Interdiction*, 89.

automate certain functions. Due to technology limitations, conducting investigations demand a high number of man hours. Law enforcement also relies on civilians to assist in investigations in which technological limitations and investigative techniques fail to produce leads in locating victims or offenders.

1. Human Intelligence

Automated software that detects illicit images on the web is a crucial tool for locating CSAM.¹¹² However, these programs do not catch all images, are not always efficient, and still require individuals to review and assess the images.¹¹³ Once the image is located, investigators with access to automated image processing tools can use programs to process the image for investigative leads through techniques such as facial recognition or object detection.¹¹⁴ Researchers have recognized the need for more advanced technology to locate and process the images by exploring potential methods and proposing new technology. To date, however, the ability to fully automate detection and processing of online child sexual imagery has yet to be achieved.¹¹⁵

Once law enforcement exhausts automated methods to search, detect, locate, and solve CSAM offenses, a human investigator must complete the investigation. While AI techniques may narrow searches by compiling possible matches, CSAM investigations use predominately manual methodologies to complete visual searches to identify persons, places or objects contained in the image.¹¹⁶ This ability for artificial intelligence (AI) to only get the user so far, has been referred to as the “last mile problem” in cyber investigations.

¹¹² Microsoft, “Help Stop the Spread of Child Exploitation,” PhotoDNA, accessed May 17, 2020, <https://www.microsoft.com/en-us/photodna>.

¹¹³ Bursztein et al., “Rethinking the Detection of Child Sexual Abuse Imagery on the Internet,” 1, 7–8; and Julia Muraszkievicz, “Crowd Knowledge Sourcing- A Potential Methodology to Uncover Victims of Human Trafficking,” in *Societal Implications of Community-Oriented Policing and Technology*, ed. Georgios Leventakis and M. R. Haberfeld (Cham, Switzerland: Springer, 2018), 26.

¹¹⁴ Sanchez et al., “A Practitioner Survey Exploring the Value of Forensic Tools,” S133.

¹¹⁵ Sanchez et al., S125.

¹¹⁶ Kurt Luther, “Solving AI’s Last-Mile Problem with Crowd-Augmented Expert Work” (Artificial Intelligence and Work: AAAI 2019 Fall Symposium, November 7, 2019), https://crowd.cs.vt.edu/wp-content/uploads/2019/12/Luther_Last-mile_AAAI_FSS_2019.pdf.

Computers can rapidly search through thousands of databases to narrow matches; however, human intelligence is still needed to synthesize data to search for broader context in images and perform final comparative analyses.¹¹⁷ Visual search tasks are needed in every CSAM investigation when a new image is located. Tasks such as image geolocation and object or facial recognition can take anywhere from hours to days to complete.¹¹⁸ Often the success of a search task is limited by the time and attention of the person conducting the search.¹¹⁹ When visual search tasks can only be completed by one or a few individuals, the tasks are not scalable as the work will continue to grow and backlog without additional persons able to assist in completing the tasks.

2. Crowdsourcing Tips in Child Sexual Abuse Investigations

When all available investigative tactics are exhausted during CSAM investigations, law enforcement may request assistance from the public in identifying objects taken from images in the background of CSAM.¹²⁰ Due to the nature of the images, only sworn law enforcement or authorized individuals may review the whole image. However, contained within the background of each image are clues which may assist law enforcement in determining the location of the offense, the identity of the victim, or the identity of the offender. This investigative tool of seeking assistance from the public is referred to as “crowdsourcing.” In simplest terms, crowdsourcing takes a task usually assigned to a specialist or group of specialists, and opens it up to a broad group for accomplishment.¹²¹ Crowdsourcing leverages the collective intelligence of many to solve problems, seek information, and in CSAM investigations, generate tips, leads and solve crimes.”¹²²

¹¹⁷ Luther.

¹¹⁸ Sukrit Venkatagiri et al., “GroundTruth: Augmenting Expert Image Geolocation with Crowdsourcing and Shared Representations,” *Proceedings of the ACM on Human-Computer Interaction* 3, no. CSCW (November 2019): 107:2, <https://doi.org/10.1145/3359209>.

¹¹⁹ Venkatagiri et al., “Groundtruth,” 107:2.

¹²⁰ Carol Christian, “Reddit Bureau of Investigation’ Aids FBI’s Battle against Child Predators,” *Houston Chronicle*, October 25, 2016, <https://www.chron.com/crime/article/Reddit-Bureau-of-Investigation-aids-FBI-s-10314455.php>.

¹²¹ Jeff Howe, *Crowdsourcing: Why the Power of the Crowd Is Driving the Future of Business* (Currency, 2008).

¹²² Daren C. Brabham, *Crowdsourcing* (Cambridge, MA: MIT Press, 2013), xix.

In CSAM investigations, law enforcement uses crowdsourcing to tap into collective knowledge. Law enforcement disseminates images of unidentified items located in the background of CSAM to citizens in hopes someone will recognize the item and assist law enforcement in the identification. When a new image of CSAM is located by any law enforcement agency in the United States, the image is sent to NCMEC to be scanned, investigated, and catalogued. NCMEC possesses a host of investigative tools to process the images and attempt to identify the image. If the image cannot be identified, it is returned to the investigative agency that sent the image for further investigation.¹²³ Law enforcement agencies across the country are responsible for investigating the images, but not all agencies possess the same resources, AI, or investigative software.

Time is of the essence in investigations; however, when all AI methods investigating images are exhausted, traditional open-source intelligence (OSINT) methods can take hours to complete.¹²⁴ Once all investigative techniques have been exhausted and the law enforcement agency wishes to seek help from the public, it can post the image of an object or person for tips or leads as to the identification or location of the image. In crowdsourcing investigations, images must reach large diverse populations of persons with unique knowledge, skill sets, or personal knowledge, to provide leads as to the identification or location of the objects in the image.¹²⁵ When investigating child sexual abuse cases, getting the right circumstances in place could be what is needed to save a child from future sexual abuse.

Crowdsourcing investigations can be an effective strategy to develop leads, locate offenders, and solve cases. In the right circumstances, the crowd can outperform the employees and lead to successful leads in less time.¹²⁶ In CSAM investigations, however, crowdsourcing is typically used as a last resort effort to stimulate leads or develop renewed public interest in a case. Thus, the intent of the current model of crowd sourcing is not

¹²³ “Rescuing Victims of Child Sexual Abuse,” FBI News, July 1, 2020, <https://www.fbi.gov/news/stories/fbi-programs-work-to-rescue-victims-of-child-sexual-abuse-070120>.

¹²⁴ Açar, “OSINT by Crowdsourcing,” 207.

¹²⁵ Howe, *Crowdsourcing*, 280.

¹²⁶ Howe, *Crowdsourcing*, 11.

designed to reduce the time needed to investigate an image or solve the limited manpower dilemma by tasking the public to conduct time consuming aspects of the investigation. Instead, it represents an investigative tool of last resort to seek new leads when all else has been exhausted.

Unfortunately, crowdsourcing has some down sides. Crowdsourcing the public in CSAM cases is designed to generate a greater number of leads in cases. Once tips are received, investigators must work to investigate tips generated from the public posting of images. Naturally, tip lines can generate both good and bad tips. Having a wider audience will likely lead to an increase in bad tips that investigators must review and eliminate.¹²⁷ Additionally, publicly posting these images can have serious implications on the underlying investigation. First, posting the image publicly can alert a suspect that the police found the image and are actively investigating the image. This act can alert suspects who may flee their current location, conceal their identity, destroy evidence, and potentially harm or relocate the victim. This reality may deter law enforcement officers from using crowdsourcing methods as it could harm their investigation. Further, engaging the crowd to assist in investigations also may lead to crowds taking steps upon themselves to act as vigilantes or acting in a manner that hurts investigations.¹²⁸ When crowdsourcing methods deployed by agencies are unclear or unfocused, the tips received may be of limited merit to the agency or produce apathy in the online community to continue crowd sourcing.

Despite drawbacks to crowdsourcing, establishing better ways to involve the public and create a national response could assist in combatting the problems facing investigators. By creating opportunities for the public to assist law enforcement, it could serve to not only increase the number of individuals helping to identify images, locations or offenders, but could also create awareness as to the prevalence of online exploitation of children.

¹²⁷ Zercoe Cole, "Crowdsourcing Crime: Why the Public May Be Your Best Investigative Asset," Police1, March 23, 2017, <https://www.police1.com/police-products/video-storage/articles/crowdsourcing-crime-why-the-public-may-be-your-best-investigative-asset-WZIVQIirCG1XIMOU/>.

¹²⁸ Sanket Subhash Khanwalkar, "Crime Intelligence 2.0: Reinforcing Crowdsourcing Using Artificial Intelligence and Mobile Computing" (master's thesis, University of California, Irvine, 2016), 17, <https://escholarship.org/uc/item/6965r2v6>.

Based on the volume of CSAM and the escalation of online offenses against children, with the limited resources and manpower currently deployed, law enforcement is facing an insurmountable task. Although an increase in the number of individuals assisting in investigating the images is crucial, finite resources prevent hiring the number of full time officers required. Even with massive budgetary increases, it still would not be enough to provide the numbers of individuals needed to conduct the investigations. New strategies are needed to incorporate more skilled or trained individuals without harming investigations or draining already limited resources chasing bad leads or tipping off offenders.

Creating opportunities for trained volunteers to assist law enforcement in investigating online sexual crimes against children could lead to more images being investigated in less time and at less cost. Citizens with specialized skills can assist in more time-consuming tasks such as unmasking offenders or conducting open source investigations on images. By eliminating the need to disseminate images to the public for tips, the offenders would not be alerted their images are being investigated, thus protecting the investigations.

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III. USING THE CROWD

Chapter II focused on the challenges in investigations including the high volumes of complex time consuming investigations, and the reliance on manpower and human intelligence to complete these investigations. This chapter provides an in depth look at the important aspect of citizen engagement in police investigations and supporting agency missions. Police have used public assistance as a tool since the dawn of modern policing.¹²⁹ The public assists law enforcement in various ways including reporting crimes, providing tips, or serving as volunteers. Determining the advantages and disadvantages of using citizen volunteers to help investigate child sexual abuse material requires recognizing how citizens are currently assisting law enforcement. Citizens assist law enforcement in protecting and helping the most vulnerable in various ways. Crowdsourcing efforts and volunteer programs are two of the ways citizens work with law enforcement in combatting sexual offenses and crimes against children. This chapter demonstrates crowdsourcing can provide valuable leads and dedicated volunteers can support law enforcement missions.

A. CROWDSOURCING

Crowdsourcing fosters the extraordinary ability for people from all walks of life and locations to rapidly collaborate by capitalizing on the innate human need to engage and socialize.¹³⁰ Law enforcement agencies successfully use crowdsourcing for a number of purposes including locating missing children, identifying suspects of crimes, and identifying objects taken from CSAM.¹³¹ As discussed below, law enforcement agencies both in the United States and Europe use crowdsourcing as an investigative tool in CSAM.

1. Crowdsourcing Campaigns in CSAM Investigations

The FBI employs several crowdsourcing methods. The FBI's Endangered Child Alert Program (ECAP) posts images of individuals involved in the sexual abuse of children

¹²⁹ Dobrin, "Volunteer Police," 1.

¹³⁰ Howe, *Crowdsourcing*, 8.

¹³¹ Huey, Nhan, and Broll, "Uppity Civilians' and 'Cyber-Vigilantes,'" 11.

and asks for help in identifying the suspects.¹³² Additionally, the FBI posts “Seeking Information” posters which portrays images taken from the background of CSAM images.¹³³ Since its creation in 2004, the ECAP program has identified at least 28 suspects, identified 70 victims, and found 45 child victims.¹³⁴ However, the cases posted through the FBI’s ECAP program do not necessarily encompass all the active cases needing global public awareness.

Similar to the United States, European countries experience high rates of online child sexual abuse material and child sexual exploitation.¹³⁵ European investigators also experience the same investigatory roadblocks facing the United States in the form of privacy and encryption software, which increases the difficulty for investigators to locate the victims of abuse, perpetrators of the violence, and the origins of the child sexual abuse material.¹³⁶ Europol serves as a support agency to law enforcement authorities in Member States in the fight against online child sexual exploitation.¹³⁷ By pooling resources and working collaboratively on child exploitation investigations, member states can better combat threats, investigate offenses, and reduce overlapping investigations thus putting resources to better use.¹³⁸

During CSAM investigations, Europol uses all available resources to investigate or assist Member States in investigations to locate the victim, offender, or place of origin of the image.¹³⁹ After exhausting all investigative resources in locating the victims, offenders,

¹³² “Seeking Information,” FBI Most Wanted, accessed May 14, 2020, <https://www.fbi.gov/wanted/ecap/seeking-information>.

¹³³ Federal Bureau of Investigation.

¹³⁴ Federal Bureau of Investigation, “Rescuing Victims of Child Sexual Abuse.”

¹³⁵ Europol, *Exploiting Isolation: Offenders and Victims of Online Child Sexual Abuse During the Covid-19 Pandemic* (The Hague, Netherlands: European Union Agency for Law Enforcement Cooperation, 2020), 6, <https://www.europol.europa.eu/publications-documents/exploiting-isolation-offenders-and-victims-of-online-child-sexual-abuse-during-covid-19-pandemic>.

¹³⁶ Europol, 11–14.

¹³⁷ “Child Sexual Exploitation,” Europol Crime Areas, accessed July 10, 2020, <https://www.europol.europa.eu/crime-areas-and-trends/crime-areas/child-sexual-exploitation..>

¹³⁸ Europol.

¹³⁹ “Europol Launches Public Appeal to Help Identify Victims of Child Sexual Exploitation,” Europol Newsroom, May 31, 2017, <https://www.europol.europa.eu/newsroom/news/europol-launches-public-appeal-to-help-identify-victims-of-child-sexual-exploitation>.

and origins of CSAM images, Europol turns to the public as a last resort.¹⁴⁰ In 2017, Europol created the “Trace an Object” Campaign which posts batches of objects obtained from the background of CSAM.¹⁴¹ Europol posts the images in batches of 20 and seeks information regarding where the object came from or any other available information. They post a link on the website where the tips may be sent and provides the option to send tips anonymously if one chooses. Some of the photos contain objects such as articles of clothing, toys, shampoo bottles or wallpaper.¹⁴² Other images contain landscapes, buildings, and other clues as to location.

The format used by Europol enables private citizens and groups to further collaborate in major crowdsourcing efforts. Bellingcat is an online investigative community which uses OSINT to conduct, and teach others how to conduct, online investigations.¹⁴³ After Europol began the “Trace an Object” campaign, Bellingcat called upon its global collective of investigators to assist in tracing the object. Using OSINT and image geolocation techniques, members of Bellingcat spent hundreds of hours investigating objects which led to identifying objects around the world including Mexico, Panama, and Moscow.¹⁴⁴ The efforts of civilians, as demonstrated by Bellingcat, save investigators hundreds of man hours, lead to faster identification of victims, and prevent further abuse.¹⁴⁵

To build a successful crowdsourcing campaign, participation must go both ways.¹⁴⁶ To keep the community engaged and a campaign successful, using the information received

¹⁴⁰ “Police Publish Child Abuse Clues Online,” BBC News, June 1, 2017, <https://www.bbc.com/news/world-europe-40115549>.

¹⁴¹ “With Your Help We Are 21,000 Steps Closer to Saving a Child from Sexual Abuse,” Europol Newsroom, June 1, 2018, <https://www.europol.europa.eu/newsroom/news/your-help-we-are-21-000-steps-closer-to-saving-child-sexual-abuse>.

¹⁴² Europol, “Europol Launches Public Appeal to Help Identify Victims of Child Sexual Exploitation.”

¹⁴³ Venkatagiri et al., “GroundTruth,” 107:2– 107.3.

¹⁴⁴ Carlos Gonzales, “Creating Impact: A Year On Stop Child Abuse —Trace An Object,” Bellingcat, April 22, 2020, <https://www.bellingcat.com/news/uk-and-europe/2020/04/22/creating-impact-a-year-on-stop-child-abuse-trace-an-object/>.

¹⁴⁵ Gonzales.

¹⁴⁶ Howe, *Crowdsourcing*, xix.

from the community is insufficient because the crowd must learn what was done with the information.¹⁴⁷ Europol maintains open and continuous communication with the public about their “Trace an Object” campaign. They acknowledge and confirm success stories when able, and are open with the community that they are not able to provide details about successful tips to protect active investigations. This open line of communication serves as a motivator for those seeking to assist Europol in using their OSINT and image geolocation skills. They are assured their efforts are not wasted and are assisting in the location and recovery of victims of sexual abuse.¹⁴⁸

One year after starting the Trace and Object campaign, Europol received more than 21,000 tips in response to 119 images posted to their website.¹⁴⁹ In one year alone, citizen tips led to 79 objects being identified, determined the country of origin in 32 cases, and led to the identification of at least two victims.¹⁵⁰ As of January 2020, the tips generated from the Trace an Object campaign “led to the identification of ten victims identified”, “the prosecution of two offenders” and the identification or country of origin for scores of objects.¹⁵¹

Europol’s Victim Identification Taskforce (VIDTF) collaboratively investigates CSAM between EU members states.¹⁵² According to Europol, “experts in victim identification from 11 police agencies in nine countries” collaborated and pooled their collective resources and knowledge to investigate unidentified CSAM.¹⁵³ When objects or individuals are identified, or leads are developed through the Trace and Object Campaign, they are compiled and shared in the International Child Sexual Exploitation Database

¹⁴⁷ Howe, xix.

¹⁴⁸ Gonzales, “Creating Impact.”

¹⁴⁹ Europol, “With Your Help We Are 21,000 Steps Closer to Saving a Child from Sexual Abuse.”

¹⁵⁰ Europol.

¹⁵¹ Gonzales, “Creating Impact.”

¹⁵² Europol, “Efforts Stepped-up to Identify Victims of Child Sexual Abuse,” Europol Newsroom, January 16, 2015, <https://www.europol.europa.eu/newsroom/news/efforts-stepped-to-identify-victims-of-child-sexual-abuse>.

¹⁵³ Europol.

(ICSE).¹⁵⁴ The ICSE is a database shared by more than 50 countries to exchange information regarding CSAM and share resources to investigate the images, rescue children, and arrest offenders.¹⁵⁵ Since the creation of the VIDTF, international parties continue to work together to make critical connections in investigations and solve international child exploitation offenses.¹⁵⁶ The efforts of Europol demonstrate the collective resources and collaborative efforts of law enforcement, as well seeking assistance from the public, can lead to lead to the rescue of victims and better leads in CSAM investigations.

2. Crowd Sourcing Communities

Crowdsourcing in its truest sense is about the community of like-minded individuals that is formed around the goal or task.¹⁵⁷ It capitalizes on the human desire to meaningfully collaborate, and technology facilitates this collaboration by connecting people from all walks of life and every geographical location.¹⁵⁸ Absent an organized civilian volunteer program through law enforcement agencies, online communities formed dedicated to combatting cyber sexual crimes by using their own time, resources, and skill sets. Individuals who volunteer their time to assist law enforcement in CSAM investigations cite a variety of reasons for dedicating and donating their time and skills. The most common reasons cited are a desire to help others and the police, a sense of justice, being a former victim or family or friend of a victim, or a desire to use their expertise.¹⁵⁹ For many, crowdsourcing offers the unprecedented ability to connect and engage with

¹⁵⁴ Europol.

¹⁵⁵ “Child Abuse Victims Identified Using INTERPOL Database,” INTERPOL News, November 8, 2019, <https://www.interpol.int/en/News-and-Events/News/2019/Child-abuse-victims-identified-using-INTERPOL-database>.

¹⁵⁶ INTERPOL.

¹⁵⁷ Howe, *Crowdsourcing*, 6.

¹⁵⁸ Howe, *Crowdsourcing* 14.

¹⁵⁹ Huey, Nhan, and Broll, “‘Uppity Civilians’ and ‘Cyber-Vigilantes,’” 89.

likeminded individuals to create meaningful change.¹⁶⁰ The ability to collaborate is its own reward.¹⁶¹

Though the FBI and Europol's stated purpose of posting images on their websites is in the hope that someone with knowledge of the object recognizes it and sends in a tip, the tip campaigns spurred online communities to form around the desire to assist law enforcement in their efforts to solve their outstanding CSAM cases. Once images are posted, collaborative online forums on websites such as REDDIT will repost the image and begin seeking assistance from wider community members to look at the image and determine if they can assist.¹⁶² The message boards serve as ways to collaborate with other posters to search for clues using OSINT techniques or personal knowledge to narrow down locations, discuss potential leads, and seek additional clues before submitting tips to the FBI.¹⁶³

Bellingcat is a prime example of a dedicated crowdsourcing community that rallied around the solving of these images. Bellingcat uses a platform called "Clear" to communicate, brainstorm, and collaborate with individuals vetted by the organization to assist in the identification of the objects disseminated by Europol.¹⁶⁴ In 2019, Bellingcat created an independent community online board designed to increase the number of persons engaged in the 'Trace an Object campaign'. In 2020, the independent community boasted 48,000 members with 25,000 to 200,000 unique visits after a new batch of images is posted.¹⁶⁵ The leaders of the organization recognize the urgent nature of the

¹⁶⁰ Howe, *Crowdsourcing*, 14.

¹⁶¹ Howe, *Crowdsourcing*, 15.

¹⁶² Christian, "Reddit Bureau of Investigation' Aids FBI's Battle against Child Predators."

¹⁶³ Arjuna2545, "FBI Seeking Help in Identifying Objects in Pictures Taken by Child Predators," Reddit r/RBI, accessed July 21, 2020, https://www.reddit.com/r/RBI/comments/58z6l0/fbi_seeking_help_in_identifying_objects_in/.

¹⁶⁴ Christiaan Triebert, "New Objects Identified in Europol's 'Stop Child Abuse' Crowdsourcing Campaign — Third Update," Bellingcat, January 4, 2018, <https://www.bellingcat.com/news/uk-and-europe/2018/01/04/stop-child-abuse-campaign-3rd-update/>.

¹⁶⁵ Gonzales, "Creating Impact."

investigations and the need for a scaled action from all stakeholders, including the public, to combat online sexual abuse of children.¹⁶⁶

The Bellingcat community educates others in OSINT techniques, collaborates to identify objects, and increases the awareness of the Trace an Object campaign as well as the widespread nature of CSAM.¹⁶⁷ As demonstrated in Figure 1, their efforts are designed to increase the chance of rescuing a child.¹⁶⁸ The organization indicates they have hundreds of members around the globe that dedicate their own time and resources searching for the objects. Since the launch of the Trace an Object campaign, Europol has recognized Bellingcat's assistance in identifying objects and their efforts led the organization to nominated in the category of innovation for the 2020 European Press Prize.¹⁶⁹

¹⁶⁶ Gonzales.

¹⁶⁷ Gonzales.

¹⁶⁸ Gonzales.

¹⁶⁹ Gonzales.



Figure 1. Bellingcat Stop Child Abuse Trace an Object Summary 2019–2020

Members of Bellingcat have voiced their belief that crowdsourcing the public should be expanded.¹⁷⁰ Members also offered recommendations to increase faster identification of objects and increase workflow efficiency.¹⁷¹ Their ability to assist in investigations led to members of Bellingcat calling for a unified, organized, and synchronized effort between all stakeholders in the government, law enforcement, technology, researchers, NGO's and the public to tackle this global problem.¹⁷²

¹⁷⁰ Gonzales.

¹⁷¹ Gonzales.

¹⁷² Gonzales.

In addition to communities forming around heeding the call from law enforcement agencies to assist their investigations, communities also operate outside police led efforts and independently seek to search for and stop CSAM and other cyber sexual crimes against children. Civilians who combat cyber sexual crimes operate in many different forms.¹⁷³ Some act as “civilian police” who gather data and report potential crimes to law enforcement.¹⁷⁴ Many of these groups have mandatory time requirements, structure, supervision of activities, and a vetting process for becoming a member to guard against perpetrators of cyber sexual offenses from gaining access to the group.¹⁷⁵ Some groups act as vigilantes by engaging in acts of retribution independent of any law enforcement collaboration or association.¹⁷⁶ Some also act as a hybrid between a civilian police and vigilante group. Members of these groups both engage in retributive actions but also collect and relay information to police.¹⁷⁷

Groups which exist outside law enforcement led efforts can negatively impact law enforcement’s efforts. They can also interfere with undercover investigations, lead to offenders going further underground, cause victims to be publicly identified, and lead to misidentification of offenders. Law enforcement strongly opposes online vigilantism in all its forms but due to the emotional nature of these offenses, without formal programs for individuals to dedicate their time to assist law enforcement, members of the public may seek to dox, harm, or commit other acts of vigilantism against those they believe create, produce, trade, or engage in CSAM.

Often times, the best person to do a job is the person who wants to do the job.¹⁷⁸ Crowdsourcing, especially through open source efforts, is a way for organizations to complete monumental tasks. Crowdsourcing the public to complete open-source tasks is shown to not only equal the best efforts of some of the largest corporations in the world, it

¹⁷³ Huey, Nhan, and Broll, “Uppity Civilians’ and ‘Cyber-Vigilantes,” 85

¹⁷⁴ Huey, Nhan, and Broll, 85

¹⁷⁵ Huey, Nhan, and Broll, 90.

¹⁷⁶ Huey, Nhan, and Broll, 85

¹⁷⁷ Huey, Nhan, and Broll, 85

¹⁷⁸ Howe, *Crowdsourcing*, 8.

often exceeds their abilities.¹⁷⁹ Because of this, some of the largest businesses in the world spend billions to foster and capitalize on crowdsourcing efforts.¹⁸⁰ Recognizing this, law enforcement could use the already evident desire of the public to assist law enforcement, by creating expert driven crowdsourcing campaigns to support their mission of stopping CSAM, arresting offenders, and rescuing victims.¹⁸¹

B. VOLUNTEER PROGRAMS HELPING LAW ENFORCEMENT

While crowdsourcing offers an informal approach for a wider group of individuals to participate, engage, and assist in a call to action by law enforcement, volunteer programs provide a formal and structured way for citizens to employ their time and efforts in combatting crimes. Under the guidance of strict policies and procedures, some volunteer programs operate through law enforcement agencies to fill certain community needs. Others operate independently of law enforcement agencies, but do so in a structured manner and often in collaboration with law enforcement. Through an understanding of how volunteer programs currently assist law enforcement agencies, policy makers can better determine whether volunteer opportunities could be expanded to assist law enforcement in combatting CSAM by filling gaps and enhancing services already in place. Although relatively limited academic literature exists on the topic of volunteers assisting in CSAM, examples of law enforcement volunteer programs abound nationwide. The following showcase of relevant programs demonstrates not only how law enforcement volunteers are incorporated in supporting an agency's mission, but also their limitations.

1. Research Data on Volunteer Programs

Community engagement and volunteer programs are recognized tools law enforcement uses to prevent and solve crime. Successful volunteer programs do not replace existing resources, they are designed to enhance them.¹⁸² Citizens demonstrate a

¹⁷⁹ Howe, 8.

¹⁸⁰ Venkatagiri et al., "GroundTruth," 107.8.

¹⁸¹ Venkatagiri et al., "GroundTruth," 107.8.

¹⁸² Martin Alan Greenberg, *Citizens Defending America: From Colonial Times to the Age of Terrorism* (Pittsburgh, PA: University of Pittsburgh Press, 2005), 207.

willingness and desire to dedicate their time and skills to assist law enforcement in all facets of public safety. As discussed above, citizens with the skills needed to assist law enforcement dedicate their time and skills to tracking, locating, and assisting law enforcement in CSAM investigations independently or through established organizations.

Trained volunteers offer solutions to agencies where resources are strained and officers are overworked. Volunteers can assist in performing services or tasks that are labor-intensive or time consuming, freeing up time for law enforcement to perform essential duties.¹⁸³ Because volunteers serve at the discretion of the agency and to fill gaps or support the agency, their roles can change based on the needs of the agency. This opens up creative opportunities for volunteers to assist law enforcement without restructuring positions within agencies.

One of the most recognized and common reasons agencies seek volunteers is due to fiscal shortfalls and shortage of resources required to accomplish the goals of the agency and the needs of the community.¹⁸⁴ As discussed in Chapter 1, volunteers with police agencies enhance the police's ability to deter and solve crimes.¹⁸⁵ They also serve as a way of compensating for limited resources of a police agency and to offset costs.¹⁸⁶ In 2019, the national median salary for a police or sheriff's officer was \$67,600 per year or \$32.50 per hour.¹⁸⁷ Volunteers on average serve 8 to 16 hours per month but commonly serve more.¹⁸⁸ Many volunteers come highly skilled in areas which typically lead to higher salaries as well.¹⁸⁹ Police agencies who use volunteers report saving hundreds of thousands to millions of dollars each year.¹⁹⁰ Agencies are also able to maximize resources by using

¹⁸³ Greenberg, *Citizens Defending America*, 200–201.

¹⁸⁴ Wolf, Holmes, and Jones, "Utilization and Satisfaction of Volunteer Law Enforcement."

¹⁸⁵ Ren et al., "Participation Community Crime Prevention," 465.

¹⁸⁶ Ren et al., 465; and Hilal and Olson, "Police Reserve Officers."

¹⁸⁷ U.S. Bureau of Labor Statistics, "Occupational Employment and Wages."

¹⁸⁸ Dobrin, "Volunteer Police," 720.

¹⁸⁹ Wolf, Holmes, and Jones, "Utilization and Satisfaction of Volunteer Law Enforcement," 451.

¹⁹⁰ Dobrin, "Volunteer Police," 720.

volunteers to do certain tasks which enables highly trained officers to focus on tasks that require their expertise.¹⁹¹

In a 2008 study, researchers studied the fiscal impact of volunteers in five law enforcement agencies which varied in size and population served.¹⁹² The agencies chosen each required volunteers to commit to specific number of days each month.¹⁹³ The average cost of running the volunteer program was \$316,000 and the equipment cost per volunteer was approximately \$1,200.¹⁹⁴ Among the five agencies chosen, the average hourly rate was \$37.50 per hour.¹⁹⁵ One agency surveyed was the San Diego Police Department which reported 81 volunteers.¹⁹⁶ Each volunteer worked a minimum of two 10 hour days per month which was valued at \$60,750 with an annual savings of \$729,000.¹⁹⁷

In 2013, 36 percent of local law enforcement agencies reported using sworn volunteers.¹⁹⁸ This amounted to approximately 54,000 sworn volunteers and 7 percent of all sworn American police personnel.¹⁹⁹ In a 2013 study, only 2.3 percent of the almost 99 billion dollars spent by local police and sheriff's agencies in 2013 were provided by the federal government.²⁰⁰ Therefore, volunteer police forces across the United States arguably have a greater positive fiscal impact on local law enforcement agencies than the federal government.²⁰¹ Demographics plays a huge roll in available volunteers and the types of skills possessed by volunteers. In cyber investigations, engaging volunteers who have a background in cyber security, OSINT, writing code, or other areas of IT represent tremendous assets. However, individuals with those skills are generally more concentrated

¹⁹¹ Larson et al., "Reducing the Cost of Crime," 6.

¹⁹² Larson et al., 5.

¹⁹³ Larson et al., 5.

¹⁹⁴ Larson et al., 5.

¹⁹⁵ Larson et al., 5.

¹⁹⁶ Larson et al., 5.

¹⁹⁷ Larson et al., 5.

¹⁹⁸ Malega and Garner, "Reducing the Cost of Crime," 71.

¹⁹⁹ Malega and Garner, 71.

²⁰⁰ Malega and Garner, 71.

²⁰¹ Malega and Garner, 71.

in cities with large tech industries and not evenly spread out across the country to be available for agencies across the country. A program which allows volunteers to assist law enforcement agencies no matter where they are located could mitigate this unequal distribution of skilled volunteers.

2. Volunteer CSAM Programs

Many non-profits and non-governmental organizations (NGO) are dedicated to combatting online sexual offenses against children, many of whom use volunteers. These organizations operate independently from law enforcement, but provide law enforcement with tips, files, and information obtained through their work.

Innocent Lives Foundation (ILF) is a non-profit organization which seeks to unmask and track cyber sexual predators and traffickers.²⁰² The organization reports using a make-up of security professionals from around the world with expertise in all areas of online security, coding, and OSINT who donate their time to the mission of ILF.²⁰³ After completing an investigation, the ILF will turn its file over to law enforcement with all the steps taken to unmask the anonymous predator in hopes of saving law enforcement the hundreds of hours needed to conduct the same investigation.²⁰⁴ The ILF receives their cases from third party reporters, law enforcement agencies in need of assistance, or through proactively looking through online forums to locate CSAM.²⁰⁵ Since it began in 2017, the ILF reported sending 9 cases in 2018 and 86 cases to law enforcement in 2019.²⁰⁶

²⁰² "About Us," Innocent Lives Foundation, accessed July 23, 2020, <https://www.innocentlivesfoundation.org/about-us/>.

²⁰³ Innocent Lives Foundation, "Get to Know the Innocent Lives Foundation," March 18, 2020, YouTube, video, 6:47. <https://www.youtube.com/watch?v=SiDK9fiS928#action=share>

²⁰⁴ Innocent Lives Foundation, "Get to Know the Innocent Lives Foundation."

²⁰⁵ Innocent Lives Foundation, "Get to Know the Innocent Lives Foundation."

²⁰⁶ Innocent Lives Foundation, *ILF 2019 Annual Report* (Orlando, FL: Innocent Lives Foundation, 2020), <https://www.innocentlivesfoundation.org/ilf-2019-annual-report/>.

The Global Emancipation Network (GEN) is a data analytics and intelligence non-profit dedicated to finding human trafficking victims and stopping the traffickers.²⁰⁷ GEN is run by volunteers with expertise in cyber security, OSINT, and data analytics, who use their skills to serve as “White Hat Hackers” in the fight against human trafficking.²⁰⁸ Although numerous non-profits and NGOs touch the issue of human trafficking in some way, many act independently and become data silos.²⁰⁹ Thus the information gathered by each organization is not shared, or not shared in a way that is useful to the global goal of combatting human trafficking and saving victims. GEN sought to combat this by developing a site that acts as a clearinghouse for the data, and allow volunteers and other organizations to use the data in a meaningful way.²¹⁰ Using a variety of data analytic platforms, GEN collects and compiles trafficking data from the web onto a platform to “facilitate communication and technology-sharing initiatives between numerous anti-trafficking stakeholders across the globe.”²¹¹ Using information gathered from OSINT techniques, public records, bitcoin analysis, and data gathered from the trafficking on trafficking sites and forums, GEN analyses human trafficking trends, tracks traffickers, uncovers victims, and provides documentation and data to law enforcement to assist in investigations.²¹²

Individuals seeking to help combat cyber sexual crimes have found ways to engage in online cyber policing with or without assistance of the law enforcement. Many of these individuals are highly skilled in a variety of areas that are needed to combat CSAM and

²⁰⁷ “The Global Emancipation Network Approach, Mission, and Offerings,” Global Emancipation Network, accessed July 23, 2020, <https://www.globalemancipation.ngo/global-emancipation-network-mission-offerings/>.

²⁰⁸ Inna Lazareva, “Meet the Virtual Vigilantes Who Bust Human Traffickers from Their Laptops,” Reuters, June 19, 2018, <https://www.reuters.com/article/us-global-trafficking-technology-hackers-idUSKBN1JG00F..>

²⁰⁹ Splunk, *Tech Strikes Against Modern-Day Slavery*, Video, 2017, <https://www.youtube.com/watch?v=gIRk-OfiZYE&feature=youtu.be>.”

²¹⁰ Global Emancipation Network, “The Global Emancipation Network Approach, Mission, and Offerings.”

²¹¹ Global Emancipation Network.

²¹² Selena Larson, “Anti-Human Trafficking Group Uses Data to Track Criminals,” CNNMoney, August 17, 2017, <https://money.cnn.com/2017/08/17/technology/business/human-trafficking-data-global-emancipation-network/index.html>.

save victims. Many of these individuals work independently or with an established organization such as a non-profit or NGO. However, studies show groups who do engage in with law enforcement agencies have a greater success in assisting police and leading to arrests and successful prosecutions.²¹³

3. Volunteers in Missing Persons Cases

Many law enforcement agencies have found success in creating formal volunteer programs and community engagement to fill a need, support their agencies objectives of public safety, and enlist the public to combat statewide and national needs. One example is through organized volunteer programs and community engagement in missing persons investigations.

Most states have pre-planned, organized and collaborative response plans for when a child is abducted or goes missing. State and local responses are often modeled on best practices and can be adopted nationally. The more agencies using the same best practices in deploying their responses, the more cohesive the recovery and investigative response will be when time is of the essence. Many stakeholders and contributors need to take active roles in the recovery efforts. The contributors and their roles are often referred to as the “Ecosystem Outcome Contributors”, and the public serves as one of the essential contributors in a child abduction event.²¹⁴ Public awareness, involvement, updates, and volunteer training and coordination are critical elements to the best practices of missing children responses.²¹⁵

The general public acts as the “eyes and ears” for law enforcement during an incident.²¹⁶ AMBER Alerts are statewide public notifications and urgent bulletins which aim to “safely recover missing, endangered, and abducted children through the coordinated efforts of law enforcement, media, transportation, and other partners by leveraging training

²¹³ Huey, Nhan, and Broll, “Uppity Civilians’ and ‘Cyber-Vigilantes,” 90

²¹⁴ U.S. Department of Justice, *AMBER Alert Best Practices*, 2nd ed. (Washington, DC: U.S. Department of Justice, Office of Justice Programs, 2019), 11–12, <https://ojjdp.ojp.gov/sites/g/files/xyckuh176/files/pubs/252759.pdf>..

²¹⁵ U.S. Department of Justice, 10.

²¹⁶ U.S. Department of Justice, 12.

and technology to enhance response capacities and capabilities to increase public participation.”²¹⁷ All 50 states have AMBER Alert plans. As of May 2020, 988 children were rescued as a result of the AMBER Alert notifications and 66 children were rescued because of Wireless Emergency Alerts (WEA), which are alerts sent to a mobile device through mobile carriers.²¹⁸

Organized and coordinated volunteer efforts are essential to effective and efficient missing child cases. In the early stages of a missing child case, the first hours of a child reported missing is critical to their safe recovery.²¹⁹ They are also the most chaotic.²²⁰ Volunteers are frequently used in the search of missing children and there are recommended best practices for maximizing the effectiveness of using volunteers during all stages of a missing persons case.²²¹ While untrained volunteers may be recruited to perform certain tasks, trained volunteers traditionally already have been background checked, educated in what to do and not to do, have special skills and abilities, and can mobilize much quicker than untrained volunteers.²²²

In 2006 the DOJ launched a nationwide initiative called Child Abduction Response Teams (CART) to assist law enforcement agencies in effective responses to incidents of missing and abducted children.²²³ “Child Abduction Response Teams (CARTs) are multi-

²¹⁷ U.S. Department of Justice, “AMBER Alert Training and Technical Assistance” (Washington, DC: Department of Justice, September 30, 2019), 1, <https://ncjtc-static.fvtc.edu/Resources/RS00003868.pdf>.

²¹⁸ “Statistics,” AMBER Alert, May 2020, <https://amberalert.ojp.gov/statistics>; and Federal Emergency Management Agency, “Frequently Asked Questions: Wireless Emergency Alerts,” Wireless Emergency Alerts, August 6, 2020, <https://www.fema.gov/frequently-asked-questions-wireless-emergency-alerts>.

²¹⁹ Donna Uzell and Yesenia Leon-Baron, *Child Abduction Response Team Program Implementation Guide: Emerging and Best Practices* (Appleton, WI: AMBER Alert Training and Technical Assistance Program, 2018), 16, <https://www.amberadvocate.org/wp-content/uploads/2018/05/CART-Implementation-Guide-web2.pdf>.

²²⁰ U.S. Department of Justice, *When Your Child Is Missing: A Family Survival Guide*, 2nd ed. (Washington, DC: Office of Juvenile Justice and Delinquency Prevention, 2002), 2, <https://www.ncjrs.gov/pdffiles1/ojjdp/170022.pdf>.

²²¹ U.S. Department of Justice, 47.

²²² Uzell and Leon-Baron, *Child Abduction Response Team Program Implementation Guide*, 33–34; and U.S. Department of Justice, *When Your Child Is Missing*, 49.

U.S. Department of Justice, 49.

²²³ U.S. Department of Justice, “Frequently Asked Questions,” About AMBER Alert, October 20, 2019, <https://amberalert.ojp.gov/about/faqs>.

agency, often multi-jurisdictional composite of community professionals who are trained and equipped to respond in the search and recovery of an abducted or endangered child.”²²⁴ More than 7,400 CART program members and 129 active teams operate across 48 states.²²⁵ When law enforcement agencies across multi states and jurisdictions adhere to the same best practices in coordinating efforts during a missing child or abduction case, it helps with the efficiency and effectiveness of the recovery efforts. The best practices define the specific roles of each team member, including volunteers, to ensure resources are maximized, investigative or search leads are not overlooked, and everyone in the recovery effort is ready, willing, and able to accomplish their objectives during the coordinated effort. Volunteers can assist in many ways missing persons cases. Having the ability to immediately call upon and mobilize trained volunteers organized under a volunteer coordinator serves to avoid communication breakdown as well as the missing of, degradation of, or complete loss of evidence.²²⁶

Missing child and abduction cases share many of the same elements with CSAM investigations. When a child is abducted from one location, the local agency must communicate and work with other jurisdictions to ensure as many eyes and ears are engaged in the recovery effort. The recovery response relies on public knowledge, investigative techniques, OSINT methods, and coordinated multi-jurisdictional efforts. In missing persons cases, the general public may provide tips based on personal knowledge, and dedicated and trained volunteers may also play a role. Investigations into missing children cases often involve highly sensitive information as well as volunteers working in tandem with law enforcement looking for evidence.

Missing persons cases have several key difference from CSAM cases. While, missing persons cases are similar to CSAM cases in that they are highly demanding and require many contributors to mount a broad and encompassing response, in a missing person case the victim is known to the police and often times the kidnapper is as well.

²²⁴ Uzell and Leon-Baron, *Child Abduction Response Team Program Implementation Guide*.

²²⁵ U.S. Department of Justice, “Frequently Asked Questions.”

²²⁶ Uzell and Leon-Baron, *Child Abduction Response Team Program Implementation Guide*, 34.

Additionally, the location of where the abduction took place is also typically known to law enforcement. Thus, law enforcement can focus on specific search areas and limit WEA's and public notifications to key locations. Conversely, in CSAM cases, law enforcement may not know the identity of the victim and offender, and the location of the incident is typically unknown thus demanding an even more expansive notification system than the typical missing child case.

The volume is also drastically different. According to the National Missing and Unidentified Persons System (NamUS), approximately 600,000 individuals go missing each year and an estimated 4,400 unidentified bodies are recovered each year.²²⁷ While most missing persons cases are solved within the year, others remain open and become cold cases.²²⁸ In 2019, there were 421,394 missing children entries in the FBI's National Crime Information Center (NCIC).²²⁹ The circumstances ranged from family abductions, nonfamily abductions, lost, injured, critically missing young adults, otherwise missing, but runaways account for 90 percent of all missing child cases.²³⁰ NCMEC reported 26,300 runaways in 2019, of which "1 in 6 were likely victims of child sex trafficking."²³¹ Not every missing child offense meets the AMBER Alert criteria or requires in the involvement of public searches; however, law enforcement agencies may disseminate a photograph and the circumstances of the missing child on a public website in order to seek tips from the public.

C. IMPORTANCE OF CITIZEN ENGAGEMENT

As demonstrated, citizens play an important part in assisting law enforcement in its mission to protect and serve communities. Crowdsourcing, volunteering, or simply acting as tipsters, enables citizens to play an active role in combatting CSAM. The value of citizen

²²⁷ National Institute of Justice, *NamUS: A Powerful Tool for Law Enforcement Officers, Medical Examiners and Coroners* (Washington, DC: National Missing and Unidentified Persons System, 2016), 3, <https://www.namus.gov/content/downloads/publications/NamUsOverviewBooklet.pdf>.

²²⁸ National Institute of Justice, 3.

²²⁹ National Center for Missing and Exploited Children, "About NCMEC."

²³⁰ National Center for Missing and Exploited Children.

²³¹ National Center for Missing and Exploited Children.

engagement cannot be denied. To effectively combat CSAM, policy makers must maximize all resources, including citizens willing to donate their time and skills to combat offenses against children. Crowdsourcing and volunteer programs each have their own benefits and drawbacks. Individual policy makers must weigh the pros and cons of asking citizens to work alongside law enforcement to improve the investigation of CSAM offenses, arrest offenders, and rescue victims.

The next chapter will develop and analyze different policies which could help law enforcement maximize public assistance in successfully addressing the considerable challenges law enforcement faces in CSAM investigations.

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IV. POLICY OPTIONS ANALYSIS

The massive growth of CSAM is a national crisis. All available resources and new techniques are needed to rescue children and arrest those who sexually abuse them and disseminate child sexual abuse material. While some automated techniques enable law enforcement to locate and analyze CSAM, investigations are not fully automated and require individuals to conduct investigations. Agencies who actively investigate CSAM must implement strategies that combat the time it takes to investigate high volumes of images as discussed in Chapter II. Based on the rapid escalation of CSAM disseminated on the internet and law enforcement's inability to investigate the millions of images, a "more of the same" strategy is unsustainable.

An investigation into unknown images of CSAM is time consuming, labor intensive, and often requires advanced skills, expertise, and technology not available to all agencies. When more individuals search for clues within the images in a coordinated and efficient manner, they can fully review more images. This coordinated effort can lead to more victims being rescued and offenders held accountable. The current model limits individual law enforcement agencies to their own resources in the investigation of images which is not scalable. This model must be reviewed to determine if there are other methods or strategies available to support investigators and increase the successful identification of objects, victims, locations, and offenders in less time.

The next steps in evaluating the effectiveness of United States policy on incorporating the public to combat CSAM using Bardach and Patashnik's eightfold path are as follows: establish criteria, construct alternatives, and evaluate policy options. Once the alternatives were developed, they were measured against the established criteria, and the outcome was a recommendation for the most effective option.²³² The options were designed to build on current policy and open new ideas, the aim being to help policymakers and stakeholders look for less conventional yet highly impactful ways to combat CSAM. CSAM crimes are unlike any other criminal offense in their magnitude and sheer

²³² Bardach and Patashnik, *A Practical Guide for Policy Analysis*.

devastation to the lives of the victims of the sexual abuse. Members of the community are important stakeholders in the need to stop these offenses. Their potential contributions must not be discounted without a thorough review.

A. ESTABLISH CRITERIA

After analyzing the nation's policy on incorporating civilians to assist law enforcement in combatting CSAM, several recurring needs and goals emerged. The needs of law enforcement, as discussed in Chapter II, stem from the incredible volume and complexity of CSAM offenses. Dedicated law enforcement officers need strategies to ensure each image is reviewed fully and quickly without sacrificing the integrity of the investigation. The ultimate goals are to rescue victims and arrest those abusing children, locate and arrest those who possess CSAM, and stop the flow of CSAM on the Internet. From the recurring needs and goals, in order to measure the effectiveness of the policies the following five criteria were developed: (1) Efficiency, (2) Opportunity to gain intelligence, (3) Cost, (4) Implementation, and (5) Congressional support.²³³

1. Efficiency

This criterion means that the policy is an efficient method for pursuing the objectives of investigating the clues in each image, identifying victims, and identifying offenders. Due to the sheer volume of images law enforcement is tasked with investigating, efficiency was a necessary criteria for any potential policy option. An efficient method increases the number of images an investigation can review and investigate. Conversely, if a new strategy causes delays or increases the workload for investigators, it would compound the current deficiencies in investigations. Such an outcome would be not only ineffective but also detrimental to the goal of improving CSAM investigations.

Efficiency is a necessity for any strategy. Many of the tasks investigators must complete are time consuming and drain resources. Contained within each image are potentially thousands of clues to assist in locating the offender, victim, location, or individuals trading the imagery. Each clue or type of clue may require different

²³³ Bardach and Patashnik, 32.

investigative techniques to examine in depth. A lack of training or time may prevent an investigator from considering or deploying all the investigative techniques available, so strategies must include ways for investigators to inspect the different aspects of an image efficiently. Efficient strategies may serve to increase the number of clues evaluated by assigning one task for all images to one particular person or group. Although this would mean multiple persons were investigating the same image, they would be focusing on one particular technique or aspect of the image for as many images as possible. Assigning specific time consuming investigative techniques to non-law enforcement officers could free full-time investigators to conduct the main parts of the investigation without sacrificing potential clues found through time-consuming tasks or OSINT methods.

2. Opportunity to Gain Intelligence

This criterion means that the policy enables investigators to gain intelligence needed to achieve the most important premised objectives. Within each image of CSAM is a crime scene depicting sexual abuse of a child, and it must be treated as such. Each object, sound, and person in an image or video is a clue that investigators must follow to rescue victims and prevent future sexual abuse. The objects in each image may be used to establish where the abuse occurred or identify the persons in the image. While there are some parts of the image which only sworn law enforcement agencies can view, some images contain objects or landscapes from the background of images which can be viewed by non-law enforcement. Civilians could assist in using OSINT techniques to identify the object or establish the origin of an image. Any new policy must be developed to yield results without compromising active investigations or placing victims in harm's way.

3. Costs

This criterion means that the policy is not cost prohibitive. If a new policy increases the cost of an investigation without yielding a more effective, efficient result, it is less likely to be adopted.

4. Implementation

This criterion means that the policy is able to be implemented. Any new policy developed requires an implementation strategy. If the implementation is overly complicated or requires a great deal of training on behalf of law enforcement agencies, it is less likely to be used. Further, new policies must be legal and constitutional or else any development and further review of the policy would be moot. Any policy must also be implemented with stakeholders in mind. The agency in charge of implementing the policy must do so in a manner which ensures and enables other agencies or participants are able to and want to engage in the policy.

5. Congressional Support

This criterion means that the policies are politically supported in order to receive the proper funding and resources. Any new policies developed are less likely to be adopted without congressional support as national funding is necessary to implement new policies. Equally important, Congressional support and buy-in is essential if a policy requires new laws or amendments to existing laws to implement it. If an idea is unlikely to receive political support, any further development of the policy would be futile.

B. EVALUATE POLICY OPTIONS

This section evaluates selected policy options against the established criteria. After each policy option is evaluated, the three options are ranked and scored using the template depicted in Table 1.

Table 1. Policy Options Evaluation Template

	Option 1: Maintain Current Policy	Option 2: National Crowdsourcing Model	Option 3: National Volunteer Program
Efficiency			
Opportunity to Gain intelligence			
Cost			
Implementation			
Congressional Support			
Score Total			

The policy options evaluation table lists the three policy options at the top of the table, and the five evaluative criteria to the left. Each policy option criterion was given a score of either -1, 0, or +1. The policy option scores a -1 for a criterion if it did not meet the objective, a 0 if it was unclear whether it met the objective, and a +1 if the criterion met the objective. Once the policy options were scored, they were ranked based on effectiveness. The highest number indicates the most promising policy for combatting CSAM.

1. Option 1: Maintain Current Model

The first policy option explores maintaining the current model in which each law enforcement agency is responsible for its own CSAM investigation and any public assistance is sought through their own agency. Each agency deploys its own crowdsourcing methods and uses volunteers based on its policies, procedures, and needs. Decision makers within an agency may compare the current model against policy alternatives to determine the most effective policy solution.

The current model relies on the public to assist in CSAM cases in limited situations. For example, law enforcement asks the public to report crimes to law enforcement or NCMEC. Individual agencies also use crowdsourcing to help identify objects or persons found in CSAM. Each agency is tasked with their own investigations including when and how to engage the public.

a. *Efficiency*

Due to a largely independent structure to CSAM investigations combined with the volume of images, the current system is inefficient in evaluating images. Currently, each agency is required to conduct investigations once it receives the image from NCMEC or locate the image on their own and investigators may reach out to the public if all methods of investigation have been exhausted.²³⁴ The investigations are extremely time consuming, can take hours or days to complete, and are limited by the number of individuals assigned to investigate these offenses. The number of individuals assigned to work the offenses is limited by the number of officers hired by the agency to conduct the investigations. Because most agencies have relatively few employees dedicated to evaluating digital evidence forensically, the limited personnel trained in digital evidence extraction and OSINT techniques leads to backlogs of evidence needing to be evaluated.²³⁵ Those with specialized training assigned to conducting CSAM investigations are also tasked with keeping current on advances in technology, software, and techniques used to investigate CSAM which requires continuous training at a tremendous expense to the agency.²³⁶ If a trained employee leaves the agency or is reassigned to a new department, a new individual needs to receive training in the same techniques before going through the backlog.

b. *Opportunity to Gain Intelligence*

While each image of CSAM detected by law enforcement is evidence of a horrific criminal act, contained within each image are clues that could lead to the identification of a victim, offender, or location of the offense. Due to the high number of images, agencies triage cases and review the images with the youngest victims or the most extreme acts of violence first.²³⁷ The longer it takes to review an image, the more likely the evidence will go stale and victims or offenders will move locations.

²³⁴ U.S. Department of Justice, *The National Strategy for Child Exploitation Prevention and Interdiction*, 44.

²³⁵ Goodison, Davis, and Jackson, "Digital Evidence and the U.S. Criminal Justice System," 15.

²³⁶ Goodison, Davis, and Jackson, 15.

²³⁷ Dwyer et al., *Protecting Children Online*, 5.

Once law enforcement reaches a dead end with traditional investigative techniques, the investigator may reach out to the community to determine whether someone recognizes a person, object, or location. The FBI reports gaining intelligence through its EPCAT program and continues to use the program for leads. As of 2019, the program has led to the rescue of 45 child victims and assisted in identifying at least 28 suspects and 70 victims.²³⁸ While law enforcement agencies around the globe have found success in the current model, based on the escalating numbers, it is not enough.

c. Cost

While the cost of seeking limited assistance from the public would be low, the repercussions of failing to advance or pivot to new methods could cost far more than implementing additional strategies. Under this model, to review more images, law enforcement agencies would need to hire more full-time officers, IT specialists, digital forensic investigators, and law enforcement officers to conduct OSINT investigations. Hiring more full-time personnel is currently necessary but not scalable to tackle the immense numbers. Under policy option one, in order to try and keep up with the volume of images, a massive increase in funding for all law enforcement agencies in the United States is necessary to hire full time personnel in accordance with the number of individuals needed to review the images.

OSINT techniques are extremely time consuming and can take hours and sometimes days to complete. Each hour worked by each individual officer costs money and takes officers away from other full-time investigative duties. While it is impossible to calculate how many hours it takes to review an object in an image, on average at least one hour is needed to review each clue found within an image.²³⁹ If one object in an image takes an hour to investigate, and there are 10 objects in one image, that one image of CSAM would take a minimum of 10 hours to complete the OSINT investigation. If the median hourly rate for a police officer is \$32.50 per hour, the cost to review the image using OSINT

²³⁸ Federal Bureau of Investigation, “Rescuing Victims of Child Sexual Abuse”; and Don Whitehead, *The FBI Story* (Washington, DC: Government Printing Office, 2011), 26.

²³⁹ Açar, “OSINT by Crowdsourcing,” 207.

techniques is approximately \$325.00.²⁴⁰ While this one example uses 10 objects, a single image often contains thousands of digital traces within a single item, each requiring detailed investigation.²⁴¹ Continuing with the status quo is not sustainable from a cost perspective. While the exact cost is incalculable due to the different times needed to review each image, providing law enforcement agencies with enough full-time paid personnel to fully review and investigate each digital clue is not possible due to finite funding.

d. Implementation

There is no additional implementation required to maintain the status quo. While new strategies should be developed to maximize efforts to rescue victims found in CSAM, no additional implementation is necessary should the policy remain the same.

e. Congressional Support

In 2019, several members of Congress raised the alarm about a spike in CSAM reported to NCMEC and demanded that Congress take additional steps to make CSAM a priority.²⁴² Maintaining the status quo is highly unlikely to receive Congressional support in light of rising numbers, limited resources for individual law enforcement agencies, rapidly changing technology, as well as the need to deploy more aggressive and efficient strategies. New strategies are needed to combat the rapid growth in the creation, dissemination, and transmission of all forms of CSAM.

f. Projected Outcome and Trade-Offs

Maintaining the current model would likely be a miscarriage on the part of law enforcement to meet the challenges of these investigations by failing to innovate and revolutionize the investigation of CSAM. Each victim deserves the chance to be rescued, but a lack of labor and attention to these offenses can leave some victims at risk to be abused again. The images captured during the rape, torture, or abuse of a child should not

²⁴⁰ U.S. Bureau of Labor Statistics, “Occupational Employment and Wages.”

²⁴¹ Açar, “OSINT by Crowdsourcing,” 207.

²⁴² Debbie Wasserman Schultz, “Letter to Attorney General Barr and Deputy Attorney General Rosen,” August 5, 2019.

be the sole responsibility of one local law enforcement agency and the ability to rescue a victim should not be at the mercy of a law enforcement agencies staffing resources. A single image of CSAM can instantly transmit globally which necessitates a shared responsibility among all law enforcement agencies to collaborate and coordinate methods to track offenders, rescue victims, and arrest those who disseminate the images.

Failure to adapt and improve the review, investigation and analysis of images increases the number of images backlogged for officers to review and decrease the effectiveness in investigations. The longer it takes for an investigation to begin, let alone conclude, the higher the chances of an offender destroying or hiding evidence thus hindering the investigation. Changing the current model will come with some tradeoffs. Without a common structure that clearly delineates authority and shared responsibility, the existing limiting factors to efficiency and effectiveness will continue to persist. Increased funding is required to improve the review and investigation of images beyond current methods. However, additional funds will not be enough without new strategies.

An evaluation of each criterion against the first policy option resulted in an overall score of 0 (see Table 2).

Table 2. Policy Option 1 Evaluation

Efficiency	-1
Opportunity to Gain intelligence	+1
Cost	0
Implementation	+1
Congressional Support	-1
Score Total	0

2. Option 2: National Crowdsourcing Model

The second policy option expands the crowdsourcing efforts and mechanisms currently used by the FBI and Europol. Undeniably, many agencies already found success

in seeking assistance from the crowd. Finding ways to improve or maximize crowdsourcing in CSAM investigations should be explored.

A successful crowdsourcing campaign relies on maximizing the number of people with local or personal knowledge who review an image, as well as providing enough information for OSINT practitioners to conduct investigations.²⁴³ If the campaign seeks to locate individuals with personal knowledge of the object, the goal is to disseminate the images to a large number of persons to increase the chance that someone will recognize an object or person. Creating awareness campaigns for the public to know where to look for images will lead to more people visiting the crowdsourcing page while also increasing awareness as to the prevalence of CSAM and the online abuse of children. The expanded awareness of the campaign not only increases the number of people looking at the images but also makes parents and children aware of the dangers of online sexual abuse and grooming. Many law enforcement agencies have their own social media platforms, websites, and other campaigns to seek assistance from the public. However, the social media platforms of individual agencies typically reach a smaller audience than a national or international platform. According to the U.S. Census Bureau, the three most populous cities in the United States are New York City, Los Angeles, and Chicago.²⁴⁴ While The New York Police Department's official twitter account, @NYPDnews, Los Angeles Police Departments account @LAPDHQ, and the Chicago Police Department's account, @Chicago_Police, have 686,000, 191,000, and 125,000 followers respectively, the FBI's Twitter page has 2.9 million followers, reaching nearly 1.8 million more followers than all three of the most populous cities police departments in the United States combined.²⁴⁵ If the investigative goal is to reach as many people as possible to review an image, then a national platform would increase the number of people looking at an image. Posting information to a single national public facing platform increases the ability to notify a larger section of the public.

²⁴³ Gonzales, "Creating Impact."

²⁴⁴ U.S. Census Bureau, "Southern and Western Regions Experienced Rapid Growth This Decade," Census Bureau Press Releases, May 21, 2020, <https://www.census.gov/newsroom/press-releases/2020/south-west-fastest-growing.html>.

²⁴⁵ Numbers were based on each account as of August 15, 2020.

This policy creates a national crowdsourcing model that gives all law enforcement agencies access to a wider audience. The national platform requires one central agency to manage the public facing webpage as well as defining specific criteria needed before accepting images for posting. The central agency must establish pre-determined parameters for the website including the number of images displayed at one time; what information or descriptors can accompany the image; how long an image will remain on the website; and what information to provide the public after receiving a successful lead. Additionally, if there are too many images requested by law enforcement to be placed on the website, creating ranking criteria for which images to prioritize posting. Experts can determine the criteria based on qualifiers established by experts in the field such as age of victim, the number of objects needing identification in a single image, or other useable information known about an image which can assist the public.

After the criteria for posting an image is established, the next step is streamlining the process for receiving and investigating information received about the image. Once an uploaded image on the website receives tips, software filters the tips to help eliminate duplicate or unusable tips. Remaining tips are then delivered through the website to the investigating agency for further review. Other agencies will have access to the information as well, in case the tip is relevant to a similar investigation or they are able to assist the lead agency. To assist in crowdsourcing efforts for both local knowledge and OSINT practitioners, investigators should provide as much information as possible about the location or object without compromising the investigation—if a particular building is needing to be identified, providing as many known descriptors about the building and the location as possible. Providing more information affords better context for those looking at the image and assists OSINT practitioners in narrowing their investigation.²⁴⁶

Crowdsourcing is only effective if the public law enforcement is trying to reach is actively engaging in the effort. To engage the public, law enforcement must provide continuous and affirming feedback with the public whenever possible. Providing feedback to the public about tips leading to an arrest or identification of an object serves to recognize

²⁴⁶ Gonzales, “Creating Impact.”

the efforts expended by the public and motivates people to continue assisting.²⁴⁷ To further serve as motivators, annual commemoration events celebrating the public's help in assisting in CSAM cases would provide recognition to the efforts of civilians. Equally important, public events celebrating the public's efforts serves to raise awareness to the campaign itself as well as online safety precautions to prevent minors from being manipulated by online predators. This potential commemoration event for CSAM is similar to the National Missing Children's Day ceremonies hosted by the Department of Justice and many other state agencies which pay tribute to the individual efforts of those who protect children; provides awareness for parents and children; and engages the community in bringing awareness to missing children around the country.²⁴⁸ Similar recognition efforts could be applied to those who assist law enforcement in combatting CSAM. Better engagement from agencies serves as a motivator for the public to use their time and efforts to assist law enforcement.

Finding the right crowd is difficult but necessary when building a crowdsourcing community.²⁴⁹ Law enforcement reaching out to well-respected OSINT communities about the campaign could increase involvement by key OSINT practitioners. Organizing community events or "hackathons" to bring college students, OSINT practitioners, criminal justice professionals, or others with key skills and knowledge could lead to better involvement in the campaign while solving outstanding CSAM cases.²⁵⁰ To assist in crowdsourcing efforts for both local knowledge and OSINT practitioners, investigators should provide as much information as possible about the location or object without

²⁴⁷ Anna Ståhlbröst et al., "Understanding Modes of Crowdsourcing and Related Crowd Motivators," in *ISPIM Conference Proceedings* (Manchester, United Kingdom: The International Society for Professional Innovation Management (ISPIM), 2015), 1, ProQuest.

²⁴⁸ "About Missing Children's Day," National Missing Children's Day, 2020, <https://ojjdp.ojp.gov/events/missing-childrens-day/2020-commemoration>.

²⁴⁹ Ståhlbröst et al., "Understanding Modes of Crowdsourcing and Related Crowd Motivators," 2.

²⁵⁰ U.N. Office on Drugs and Crime, "UNODC and IBM Organize Hackathon to Identify Tech-Based Solutions Against Human Trafficking," United Nations Office on Drugs and Crime, March 25, 2019, <https://www.unodc.org/unodc/en/frontpage/2019/March/unodc-and-ibm-organize-hackathon-to-identify-tech-based-solutions-against-human-trafficking.html>; Thorn, "Thorn Hackathon to Fight Child Exploitation," *Thorn* (blog), August 25, 2014, <https://www.thorn.org/blog/thorn-hackathon-fight-child-exploitation/>; and Miguel Lara and Kate Lockwood, "Hackathons as Community-Based Learning: A Case Study," *TechTrends* 60, no. 5 (September 2016): 486–95, <https://doi.org/10.1007/s11528-016-0101-0>.

compromising the investigation. Including as many known details about the image or location provides better context for those looking at the image and assists OSINT practitioners in narrowing their investigation.²⁵¹

A national crowdsourcing platform led by experts in the field of combatting CSAM would maximize the number of people with local or personal knowledge who review images. Further, providing enough information for OSINT practitioners to conduct investigations serves to increase the speed and ability of OSINT practitioners to assist all participating law enforcement agencies in identifying objects for CSAM investigations.

a. Efficiency

While dissemination to a larger audience can increase the chance of reaching someone with personal knowledge, it also leads to greater instances of bad tips. These bad tips can take time to eliminate, thus forcing investigators to spend time away from other duties, investigations, or pursuing other leads. Although certain filtering software and other technology can limit the number of tips needing review, eliminating tips still requires allocating time and resources. However, tips received from crowdsourcing campaigns have led to locating offenders, victims, and identifying objects. A national crowdsourcing model would be more effective at reaching the most people reviewing an object, if that is the goal of the investigation. Nevertheless, it would not increase the efficiency of reviewing the massive backlog of cases or likely decrease the time it takes to review that image.

While seeking public or OSINT community assistance in identifying an object in an image could open up new leads, due to the need to protect investigations, law enforcement is not likely to include an image on the national crowdsourcing website until a complete investigation has concluded. This disinclination is due to law enforcement's wanting to avoid tipping off the offenders they are investigating. Therefore, this option does not increase the efficiency of reviewing CSAM images.

²⁵¹ Gonzales, "Creating Impact."

b. Opportunity to Gain Intelligence

When using a national platform, agencies increase the number of people looking at an image. A larger number of persons aware of the campaign and looking at the images increases the chance someone will recognize an object or person. Awareness campaigns not only inform individuals where to look for images in order to increase the number of people visiting the crowdsourcing page, they also educate the public as to the prevalence of CSAM and the online abuse of children. A national campaign serves not only to increase the number of people looking at the images but also to make parents and children aware of the dangers of online sexual abuse and grooming.

As previously detailed, crowdsourcing is an investigatory tool used by law enforcement agencies and intelligence agencies as an effective method for gaining intelligence in solving CSAM offenses. Not all agencies are created equal or are given the same amount of resources, technology, or specialists who can conduct online investigations. A national crowdsourcing site provides all agencies access to a national platform to seek assistance identifying individuals, objects, or locations. By pooling resources and allocating time and turning focus on certain investigations, a national site creates opportunities for some agencies to gain intelligence through methods not currently at their disposal due to lack of personnel and resources.

Many individuals with specialized skills in OSINT techniques or IT use their abilities to assist law enforcement in locating or identifying objects or persons with their skill set rather than personal knowledge.²⁵² A national crowdsourcing platform could enable experts in crowdsourcing OSINT efforts to locate the images, conduct their own investigations, and work collaboratively with other individuals to assist in identifying the objects. Law enforcement could provide as much detailed information about the image as possible or already identified objects within the image without compromising the investigation. Doing so would cut down on what civilians must decipher on their own and

²⁵² Senay Boztas, "Picture Clue: Cops Turn to Amateur Web Sleuths to Help Crack Cases," *The Guardian*, February 4, 2019, <https://www.theguardian.com/world/2019/feb/04/picture-clue-cops-turn-to-amateur-web-sleuths-to-help-crack-cases>.

help narrow the search.²⁵³ By creating a nationwide campaign, it increases the number of individuals with potential personal knowledge looking at an item and increases the number of individuals with specialized online investigatory skills reviewing them as well.

Social media campaigns reaching a larger audience can lead to useable information and helpful leads, but it is also a double-edged sword. A national campaign could increase the chance offenders know they are under investigation. This may lead the offenders to take steps to conceal themselves or their victims, alter their appearance, move locations, or take steps to derail active investigations. However, when law enforcement has hit a dead end with leads, a national crowdsourcing model may be its only opportunity to gain more leads.

c. Cost

Creating a national crowdsourcing platform will require funding to design, create, and build the platform, as well as ongoing costs. The ongoing costs include the administration of the platform to monitor the images, the tips received, and the update of the platform when tips are solved. Agencies such as the FBI use a platform to engage crowdsourcing, however this platform would pool other agencies into one centralized location. Thus, a national platform would provide an outlet for agencies unable to afford their own crowdsourcing websites while also allowing other agencies to dispense with the costs of their own. While there will be costs associated with the platform, it may decrease overall costs through the pooling of resources.

d. Implementation

The law enforcement community engaged in the investigation of CSAM is tight-knit, collaborative and very well organized. They participate on multiple platforms to exchange tips, track offenders, investigate images, receive new images to investigate, and share investigation strategies. Internet Crimes Against Children (ICAC) task forces could implement the national platform as they already work with state, local, tribal, federal, and prosecutorial agencies to investigate and combat crimes against children facilitated by

²⁵³ Gonzales, “Creating Impact.”

technology.²⁵⁴ These task forces could develop criteria for posting images and develop policy and procedures to implement the program. Each ICAC task force can work with agencies in designated regions to review and prepare the images for posting on the national crowdsourcing website. Collaborating with ICAC task forces serves to ensure images are properly vetted and meet the requirements before posting. Once the images are posted, ICAC task forces can assist the agencies in fielding tips and assisting in the investigations. The more agents working on the images, the faster the offenses can be solved or victims rescued.

e. Congressional Support

Crowdsourcing is already an investigative tool used by law enforcement. Since the 2008 PROTECT Act was implemented, ICAC has received millions in funds to proactively and reactively combat cyber sexual offenses against children, but experts and law makers recognize it has not been enough to fully combat the problem.²⁵⁵ The goal of the crowdsourcing method is to combat CSAM and rescue victims, so it is likely to garner congressional support to create and implement the platform.

f. Potential Outcomes and Tradeoffs

Adopting a national crowdsourcing model would likely increase the number of objects, locations, or images from the background of CSAM given focused attention. Similar to the Europol model, a national model gives all U.S. agencies an opportunity to engage a wider civilian audience to serve as the eyes and ears for agencies seeking leads and tips in CSAM. Engaging a wider audience increases the chance of an image being recognized by someone with knowledge and sending a tip.

A national model would increase the public's awareness these offenses exist and help make the public more vigilant about sexual offenses. It also provides information about where to go if someone locates CSAM online or suspects someone is in possession

²⁵⁴ "ICAC Task Force Program," Internet Crimes against Children Task Force Program, 2017, <https://www.icactaskforce.org/about-us..>

²⁵⁵ Michael H. Keller, "A \$5 Billion Proposal to Fight Online Child Sexual Abuse," *New York Times*, May 5, 2020, <https://www.nytimes.com/2020/05/05/us/child-abuse-legislation.html>.

of CSAM or abusing a child. Providing all known information about the image offers better context as to the image itself. More details as to what the image is or the potential region it is from increases the chance an individual will recognize the image and potentially decrease time spent conducting an OSINT investigation.

The tradeoffs with a national crowdsourcing model are the costs associated with building and maintaining the platform, as well the full-time staff needed to run and monitor the posting of images, filtering tips, and coordinating between agencies. Tip lines can generate both good and bad tips. Having a wider audience will likely lead to an increase in bad tips, which require individuals to review and eliminate. Furthermore, publicly posting these images can alert a suspect that the police are looking for them. In order to minimize the negative aspects of the crowd sourcing efforts, specific policies and procedures should be in place to ensure the images posted on the website will not harm an active investigation into the image.

An evaluation of each criterion against the second policy option resulted in an overall score of 2 (see Table 3).

Table 3. Policy Option 2 Evaluation

EFFICIENCY	-1
OPPORTUNITY TO GAIN INTELLIGENCE	+1
COST	0
IMPLEMENTATION	+1
CONGRESSIONAL SUPPORT	+1
Score Total	2

3. Option 3: National Volunteer Program

The last policy option is to establish a national volunteer program designed to assist law enforcement in different tasks including identifying the locations and objects from the CSAM images without exposing the volunteers to the actual sexual abuse imagery. This

option resembles option two, but with a formal structure whereby volunteers undergo background checks, commit to volunteer hours, receive training, and work under the supervision of a volunteer coordinator.

Volunteer programs have been used throughout modern-day policing to fill gaps from insufficient resources or combat community wide issues.²⁵⁶ The BJA recommends and encourages the use of volunteers to bolster public safety services, maximize resources, and increase community involvement and buy-in.²⁵⁷ Establishing a national volunteer program enables volunteers with specialized skills to assist in aspects of an investigation that does not require a sworn law enforcement officer. Working under the guidance and supervision of a volunteer coordinator, volunteers will work with law enforcement agencies around the nation that request assistance. Volunteers would be trained, background checked and given explicit protocol and instructions on how to conduct OSINT investigations or any other volunteer activities geared towards increasing the number of images reviewed and the speed in which the reviews are completed.

While the crowdsourcing option pulls from the general public, creating a dedicated volunteer program enables law enforcement to outsource certain aspects of the investigation to trained and screened volunteers in a structured and measured capacity. Crowdsourcing relies on the public to assist, but there is no guarantee members of the public are looking at the image let alone conducting investigations into the image. Further, releasing images to the public can risk the investigation if the offender uses the information to protect themselves through concealment or destroying evidence. Conversely, a volunteer programs ensures the review and investigation of the image in a formal manner under strict policies and procedures.

The establishment of a national volunteer program entails a central agency, most likely the Department of Justice, to build and maintain a volunteer program designed to serve all law enforcement agencies in need of assistance. The national volunteer program would create a platform for volunteers and law enforcement to access regardless of their

²⁵⁶ Greenberg, *Citizens Defending America*.

²⁵⁷ Bureau of Justice Assistance, *Volunteer Programs*.

physical location. Volunteers could work either through a secure network accessible from the location of their choice, or at dedicated field offices throughout the nation where volunteers can work in a secure building in the most geographically convenient location. A key element to developing a virtual volunteer program is providing an easy and convenient method and platform to assist law enforcement.²⁵⁸

Establishing how and where volunteers may access the images needing investigation is a key element to building a national program that must be decided by experts in the field. Due to the highly confidential nature of the material, some law enforcement officers may be uncomfortable allowing volunteers to access secure files from personal computers, laptops, or other areas where third parties may view the images. Those disinclinations must be weighed against the understanding that some skilled and trained volunteers would likely be willing to dedicate their time and efforts if they can do so at the most convenient time and location for them.²⁵⁹ A volunteer's availability could limit when a volunteer is able to conduct investigations if physical locations are not accessible twenty-four hours a day. When building the program, weighing these concerns is essential in order to find the best approaches to building an effective program without compromising investigations.

After establishing the program, what the volunteers can assist in ranges in a variety of tasks depending on the needs of the agency, the training available to volunteers, and the policies and procedures of the program. Due to the highly confidential and potentially traumatizing nature of the images depicting acts of sexual abuse against children, at no point should volunteers be exposed or given access to the full images themselves. The images can produce secondary trauma on the viewer, therefore coordinators must take precautions to ensure the volunteers are not exposed to the images of sexual abuse.²⁶⁰ There are many tasks volunteers can assist in without the need to view the whole image

²⁵⁸ Avinoam Baruch, Andrew May, and Dapeng Yu, "The Motivations, Enablers and Barriers for Voluntary Participation in an Online Crowdsourcing Platform," *Computers in Human Behavior* 64 (November 2016): 930, <https://doi.org/10.1016/j.chb.2016.07.039>.

²⁵⁹ Baruch, May, and Yu, 938.

²⁶⁰ Perez et al., "Secondary Traumatic Stress and Burnout," 113.

including conducting OSINT investigations of objects in the background of images or the internet identifiers, as well another potential identifying information of those trading in CSAM. Experts in the field will determine the most effective, efficient ways volunteers may assist in CSAM investigations and create procedures for volunteers to follow in each investigation.

a. Efficiency

There is a demonstrated need for more individuals with specialized skill sets to assist in investigating CSAM. Incorporating skilled volunteers who can assist law enforcement will not replace full time employees or the demand for more full time dedicated investigators. However, they could serve to speed the review of evidence, assist in investigations, and free law enforcement officers from certain tasks to devote their time to other duties. By assisting in the time consuming OSINT investigations of objects or persons taken from CSAM, volunteers can decrease the time it takes any agency to review an image and increase the number of images reviewed. The longer it takes to review an image, the greater chance the victim will be abused again and the more difficult the investigation becomes. Thus increasing the number and speed at which images are reviewed is essential.

Due to the volume of images, investigators are unable to handle the case load at its current level. Volunteers could review the less prioritized images or be given certain tasks or duties that are often put off due to lack of manpower. The more individuals assigned to reviewing the images, the faster the images will be reviewed and in less time.

A national program would allow experts from all over the country to volunteer under one program. A volunteer coordinator will set up procedures, policies, and dedicated times and duties for each volunteer. A national program serves as a more efficient model than each individual agency having their own volunteer program. Volunteer programs take time, resources, and money to start up and maintain and not all agencies have the ability to start a volunteer program. A national program pools resources and provides assistance to agencies who otherwise may not have the ability to use volunteers.

Having a single dedicated volunteer program that assists in investigations around the country ensures each volunteer is working under the same guidelines and training. This creates a standardized approach to how volunteers assist, investigations are conducted, and volunteer efforts are documented. Volunteers will work under the supervision of a volunteer coordinator to minimize an agencies liability, standardize how OSINT investigations are conducted, and ensure investigations are conducted without violating Constitutional principles and risk jeopardizing criminal convictions.

b. Opportunity to Gain Intelligence

A national volunteer program provides all agencies with access to the technology and skilled individuals needed to conduct OSINT investigations. OSINT techniques are widely used by law enforcement and many other industries to locate persons, identify objects, and establish links between email addresses and internet identifiers. Dedicated volunteers trained in conducting OSINT investigations already assist law enforcement in CSAM investigations. Law enforcement crowdsourcing campaigns yield demonstrated results from OSINT communities which assist in active investigations.²⁶¹

While crowdsourcing is beneficial, those who assist do so in an informal basis and can choose to assist if they wish but have no requirement to assist. A volunteer, however, would be required to dedicate certain hours or work certain times to assist law enforcement. This ensures volunteers are actively investigating specific images and coordinators can review and track progress by volunteers. Additionally, under a formal volunteer program, volunteers may be provided more information than the general public about an object or person to assist in their investigation. While law enforcement may wish to keep certain details private during a crowdsourcing campaign to prevent an offender from knowing too much about what law enforcement has already devised, a volunteer program would not have the same concerns. Volunteers could be given access to certain information to speed up an OSINT investigation without worry that the perpetrator would see the information. The more details known at the beginning of a OSINT investigation serves to speed up an investigation and leads to better results. Volunteers in a formal setting can access

²⁶¹ Gonzales, "Creating Impact."

information not available to the public regarding an image to assist in the OSINT investigation. Having a dedicated set of volunteers reviewing images not only assists in the underlying OSINT investigations, it also helps to decrease the time needed to review an image and opens up additional leads.

c. Cost

There is a cost to implement any volunteer program. A nationally coordinated program will require an online platform accessible to volunteers, as well as a database capable of storing the images and updates from the case investigations. There are standard costs associated with any law enforcement volunteer program including background checks, human resources costs, as well as equipment and/or software for volunteers and the coordinators. Volunteers and law enforcement agencies need the capability to access the programs from secure computers or VPNs to protect confidential information. Full-time law enforcement coordinators need to create policy and procedures for volunteers, as well as monitoring the volunteers and reviewing the work for submission back to the investigating agency. The number of coordinators is based on the number of volunteers, so the costs associated with the coordinators may increase over time as more volunteers are added.

However, the cost of the national volunteer program could defray the costs saved by not having to pay full time officers for the hours worked. Skilled volunteers assisting in investigations serves to supplement investigations without requiring agencies to pay hourly wages to the volunteers. Volunteers do not replace full-time investigators but enable the reviewing of images faster and without additional hourly costs to the agency. Without available numbers to determine the cost of implementing the program against the hours worked by volunteers, it is not possible to determine the cost benefit analysis of a national volunteer program.

As with any volunteer program, beginning the program may prove challenging. Due to the highly skilled nature of the volunteers required to conduct investigations, recruitment must target individuals with specialized skills. The civilian population has already demonstrated its desire to help law enforcement as evidenced by those who

informally volunteer their time to assist in crowdsourcing tips from CSAM images. Recruitment will need to target those same individuals and seek a commitment to dedicated hours to assist. Additionally, NGOs and non-profits are set up around the desire to help combat CSAM, many of which began because the founders desired to help combat CSAM but there were no programs to which they could donate their time and skills. Recruiters can work with these NGOs to assist in locating individuals who may wish to formally volunteer with law enforcement to combat CSAM.

d. Implementation

The implementation of a national program acknowledges the need to ensure every law enforcement agency investigating CSAM is given the same opportunities for assistance while also sharing resources and investigation strategies. Volunteers can work with a national coordinator either at an agency or through a secure platform accessible from a remote location. After completing their training, volunteers can be assigned various tasks such as reviewing background objects or images for identification. No images of sexual abuse or confidential information about the victim will be disclosed. The volunteers will detail steps taken and results yielded from their investigation. Once the investigation is complete, the volunteer coordinator will review the results before sending to the investigating agency. Volunteers must dedicate certain amount of hours per week or month to the investigations. In order to become a volunteer, the same background checks and onboarding process for any law enforcement volunteer must be conducted. Though the case details will remain confidential, an important part of maintaining volunteers is ensuring they are motivated to conduct the work. Providing updates and feedback to volunteers to show how their work assisted in the investigation programs can be a strong motivator and improve work product.²⁶²

Annual awards banquets or quarterly meetings will allow volunteers to build a community within the volunteer program. Community is an important part of any volunteer program to foster a sense of unity, camaraderie, and adds a social aspect to the program

²⁶² Baruch, May, and Yu, “The Motivations, Enablers and Barriers,” 926.

which many volunteers cite as an important reason they volunteer.²⁶³ Creating a national program could fill the altruistic need for people to help, while assisting law enforcement agencies across the country. Many law enforcement agencies already have procedures for implementing and managing volunteer programs. The national coordinating agency can follow the same procedures for implementing any police volunteer program while ensuring the recruitment and tasks are geared towards combatting CSAM.

e. Congressional Support

Civic engagement is one of the cornerstones of our nation and volunteer programs garner a great deal of political support. State and federal programs devote billions to combatting CSAM and human trafficking annually, and politicians are calling upon the law enforcement community to assist in new ideas to combat these offenses.²⁶⁴ Congress is likely to support an initiative that includes incorporating skilled members of the public willing to volunteer their time and expertise to combatting CSAM and helping law enforcement and victims of sexual abuse.

f. Potential Outcomes and Tradeoffs

A national volunteer program designed to allow civilians to assist in certain aspects of CSAM investigations would likely lead to an increase in the number of images reviewed in less time. CSAM investigations are very time consuming, especially during open-source investigations. A volunteer program incorporating individuals with specialized skills who can conduct OSINT investigations could reduce the amount of time spent by law enforcement officers on certain aspects of investigations. Volunteers taking over time-consuming aspects of an investigation allows law enforcement to focus their skill sets on other aspects of the investigation.

By decreasing the time it takes to review an image, law enforcement could locate offenders and victims more rapidly, thus improving the opportunity to rescue the victim

²⁶³ Baruch, May, and Yu, 924.

²⁶⁴ Wasserman Schultz, “Letter to Attorney General Barr and Deputy Attorney General Rosen,” August 5, 2019.

and preventing further sexual abuse. Volunteers can also assist in other areas of CSAM investigations, including locating individuals who are trading the images. It takes a great deal of time to locate individuals who possess, disseminate, or trade CSAM through various open-source or investigatory methods. Volunteers could assist in certain steps and decrease the amount of time it takes to locate these individuals, thus giving offenders less time and opportunity to destroy evidence or download more CSAM.

A national model would allow a single agency to recruit, train, and screen volunteers from all over the nation to provide assistance to any domestic agency in need. While all volunteer programs require funds to implement and maintain, a national model would eliminate the need for each individual agency to absorb the costs of starting a volunteer program by centralizing under one agency. Not only would this model be more efficient, all law enforcement agencies would have access to a large pool of skilled civilian volunteers to assist in their investigations regardless of location or agency resources. Under a national program, each law enforcement agency is given equal access volunteers to assist in investigations.

By allowing volunteers to conduct OSINT investigations, law enforcement limits the risk of disseminating the objects found in images and offenders images publicly and prevents an offender from being tipped off the police are looking for them. If an abuser discovers police are investigating their images, it could lead to destruction of evidence or offenders moving or changing their appearance. Volunteers could contribute by reviewing images that are not ready for public dissemination and assist law enforcement in tackling the millions of images needing investigation.

A national program would be run by a volunteer coordinator who provides explicit protocol and procedures for how investigations are to be conducted and how their efforts are to be documented for evidentiary purposes. Having civilians assisting in investigations without strict guidelines could potentially lead to suppression issues at trial. However, if the volunteer acts in accordance with the mandatory procedures in place that are approved by both investigators and the legal department, it reduces the risk of suppression of evidence due to constitutional violations. As previously detailed, many individuals already conduct their own independent investigations into CSAM offenses as a means of assisting

law enforcement; however, many work independently of law enforcement or off law enforcement tips. Providing those who are willing to spend their personal time assisting in investigations with the opportunity to do so under strict guidelines and monitoring could avert constitutional violations, harassment of potential suspects, or interference in police investigations.

The tradeoffs of a volunteer program are in the costs. However, these costs can be substantially less than each individual agency implementing their own volunteer agency or hiring of full-time law enforcement to conduct the OSINT investigations, which is not scalable due to finite funded positions.

An evaluation of each criterion against the third policy option resulted in an overall score of 4 (see Table 4).

Table 4. Policy Options 3 Evaluation

EFFICIENCY	+1
OPPORTUNITY TO GAIN INTELLIGENCE	+1
COST	0
IMPLEMENTATION	+1
CONGRESSIONAL SUPPORT	+1
Score Total	4

C. RESULTS

After an in depth comparison of the three policy options, policy option 3 received the highest score with a total of 4. The second highest score was policy option 2 with a score of 2, followed by policy option 1 which scored a 0. The final chapter of this thesis will examine policy option 3 and discuss how this policy could be developed and implemented to assist law enforcement in using volunteers to combat CSAM.

V. CONCLUSION

This thesis sought to analyze the advantages and disadvantages of using citizen volunteers to help investigate child sexual abuse material. To do so, this thesis demonstrated ways citizens currently assist law enforcement through formal volunteer programs and crowdsourcing, as well as highlighting the greatest challenges cited by law enforcement in CSAM investigations including high volume of images with insufficient resources or personnel to fully investigate the images. From the evidence presented, the five criteria of efficiency, opportunity to gain intelligence, cost, implementation, and congressional support were established to assist in comparing three policy alternatives: maintaining the status quo, creating a national crowdsourcing model, and establishing a national volunteer program. The five criteria were weighed, reviewed, analyzed, and scored for each policy option.

A. FINDINGS

After analyzing the greatest challenges facing law enforcement in CSAM investigations—and the different ways citizens assist law enforcement through formal and informal methods—this thesis found that option three, establishing a formal volunteer program, to be the most promising policy alternative to assist law enforcement in CSAM investigations. In applying Bardach's model, chapter IV showed that options one and two fail to accomplish the same objectives or maximize the same resources as policy option three. While policy option 1 and 2 scored zero and two points respectively, policy option three received the highest score of 4, as it met the goals of four of the five criteria. Of the three policy options, establishing a national volunteer program was the only policy option that increased efficiency in CSAM investigations because it increased the number of trained individuals assisting in reviewing images. Due to the rapid growth of CSAM, increasing efficiency is arguably the most important criteria of the three as it solves one of the greatest challenges in lengthy and complex CSAM investigations which is having sufficient number of individuals investigating the clues found in the images. A national

volunteer program provides all domestic law enforcement agencies with access to skilled and trained volunteers able to tackle time-consuming aspects of CSAM investigations.

As demonstrated by the overwhelming evidence presented in this thesis, due to the dramatic increases in CSAM and law enforcement not being provided the sufficient resources to meet the challenge, the status quo is not a viable option. As it relates to the second policy option, while crowdsourcing is an important investigative tool, it does not serve as the best option to expand upon due to the limitations associated with crowdsourcing. Crowdsourcing is an effective way of engaging the crowd to assist in identifying objects or completing other tasks which may lead to the identification of an offender or location of a victim. Although law enforcement can seek tips from the public, they cannot ask the public to conduct investigations due to constitutional concerns. Additionally, disseminating information to the public can harm investigations if the offender notices their image is being investigated. Therefore, crowdsourcing is typically used as a last resort. Law enforcement would not be able to release the image to the public for assistance until all methods are exhausted to protect the integrity of the investigation. Even after releasing the image, there is no guarantee members of the public are reviewing the image. Further, any leads received must be evaluated leaving law enforcement to sort and investigate potentially hundreds of bad tips, leading to more time and resources expended by law enforcement. Because of this, although creating a national crowdsourcing campaign could generate leads in cases where all investigative strategies are exhausted, it does not assist law enforcement to solve one of their greatest problems which is the time needed to investigate the image in the first place.

Technology cannot replace skilled individuals reviewing these images, therefore there is a clear need for more skilled individuals assisting in the investigation of these images. Law enforcement officers are overwhelmed by the amount of images and the time it takes to properly review them. A national volunteer program would assist law enforcement in increasing the images reviewed by taking over certain time consuming aspects of investigations. A national volunteer platform could avoid domestic jurisdictional issues, as volunteers would continue working on a case or tracking offenders no matter where they are located or where the victim is located. Child sexual abuse material and child

sexual trafficking via livestreams often span multi-jurisdictions, thus requiring a national response.

A national volunteer program also ensures cases are treated equally no matter the size or resources of the location agency. Sexual exploitation of children through the creation and dissemination of CSAM spans the globe, yet not every law enforcement agency has access to the same technology, training, and number of skilled personnel needed to investigate these offenses.²⁶⁵ A national program ensures all law enforcement agencies the ability to utilize the services of skilled volunteers regardless of their location and resources.

Throughout modern history, law enforcement volunteers have supported law enforcement missions and engaged in community wide efforts to combat public safety issues. Studies show that when civilians work with law enforcement as opposed to independently, it yields greater results.²⁶⁶ When civilians work on their own, their unofficial actions can lead to evidentiary issues, vigilantism, and potentially interfere with active police investigations. Members of the public are seeking out ways to assist law enforcement to combat CSAM by dedicating their time, resources and skills. A national volunteer program would serve the dual purpose of helping law enforcement fill gaps in investigative needs while creating meaningful opportunities for civilians to contribute to the fight against child sexual exploitation.

B. NEXT STEPS

After determining a national volunteer program as the best policy option, the next crucial steps for implementation require key agencies and law enforcement officers who specialize in CSAM investigations to determine in what capacity volunteers can best serve the objectives and needs of CSAM investigators. Once key stakeholders determine in what role volunteers can serve most effectively, experts can begin designing and building the platform from which volunteers will work and receive their assignments. Understanding

²⁶⁵ Mitchell and Boyd, *Understanding the Role of Technology in the Commercial Sexual Exploitation of Children*, 22.

²⁶⁶ Huey, Nhan, and Broll, “‘Uppity Civilians’ and ‘Cyber-Vigilantes,’” 212.

the volunteer's role is key when building a platform with the right capabilities and functionality. Further, knowing in what specific capacity volunteers will assist enables the volunteer program coordinators to identify the type of skills volunteers need to assist in the investigations as well as what sort of training is required. Once these key objectives are established, the volunteer program can begin implementation under the guidance, as well as the established policies and procedures, of the agency tasked with implementing the national volunteer program.

C. CONCLUSION

Since the advent of the internet, offenders of child sexual abuse material have found ways to trade and disseminate child sexual abuse material while law enforcement has tried to stop them. As technology advances, so do the methods and means for disseminating all forms of CSAM which has led to the dramatic increase in imagery being traded, viewed, and created. As devastating as it is to believe, trading, disseminating, and viewing CSAM is a high-reward, low-risk offense for those who are compelled to view, trade, and create these images.

The amount of images being disseminated around the world demonstrates a national and international problem. The more people involved assisting in solving these cases, the greater chance we have as a nation to stop the spread of these images and rescue victims. It is up to us to make sure disseminating CSAM is no longer a low-risk crime. Increasing the images reviewed, offenders arrested, and victims rescued is necessary to slow the rise in images and punish those who continue to perpetuate these horrific crimes. One way to accomplish these goals is to establish a national volunteer program that uses skilled volunteers to assist law enforcement around the country in CSAM investigations.

Citizen volunteers already assist law enforcement in a variety of ways. A coordinated effort between law enforcement and civilian volunteers in investigating CSAM serves to increase the efficiency of investigative hours, the viability of civilian OSINT investigations, and the ability of civilians to take meaningful steps towards helping combat CSAM. Civilian volunteers want to make a positive impact on their community. Many volunteers cite a specific passion and drive to assist law enforcement in combatting child

sexual abuse. A national volunteer program supports volunteers in their effort to help, while also assisting law enforcement to accomplish their objectives. We as a nation should be doing all we can to combat the sexual abuse of children. Politicians are demanding new approaches and greater resources be dedicated to combating these images.²⁶⁷ A national volunteer program is one step towards this goal.

The number of victims waiting to be rescued is incalculable. Each image is a depiction of torture, sexual abuse or exploitation. Demand for new images has increased, leading to the active sexual abuse of children to meet these demands. Contained within these images are some of the most horrific acts imaginable being done to children and infants, that even viewing these images is known to cause secondary trauma for law enforcement officers.²⁶⁸ If just viewing the image can lead an officer to suffer mentally and emotionally, one can only imagine the horror and trauma the actual child in the image is experiencing.²⁶⁹ Many of the children abused in the images cannot rescue themselves and can only wait in the hopes of being saved. What does it say about a nation that knows children are being sexually abused, sees the abuse daily, but doesn't do everything in its power to stop it? If a national volunteer program could save even one child from the horrific acts of sexual abuse, it would be worth it.

²⁶⁷ Wasserman Schultz, "Letter to Attorney General Barr and Deputy Attorney General Rosen," August 5, 2019.

²⁶⁸ Perez et al., "Secondary Traumatic Stress and Burnout."

²⁶⁹ Perez et al., 115.

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LIST OF REFERENCES

- Açar, Kemal Veli. "OSINT by Crowdsourcing: A Theoretical Model for Online Child Abuse Investigations." *International Journal of Cyber Criminology* 12, no. 1 (June 2018): 206–29. <https://doi.org/10.5281/zenodo.1467897>.
- . "Webcam Child Prostitution: An Exploration of Current and Future Methods of Detection." *International Journal of Cyber Criminology* 11(1) (April 2017). <https://doi.org/10.5281/zenodo.495775>.
- Arjuna2545. "FBI Seeking Help in Identifying Objects in Pictures Taken by Child Predators." Reddit r/RBI. Accessed July 21, 2020. https://www.reddit.com/r/RBI/comments/58z6l0/fbi_seeking_help_in_identifying_objects_in/.
- Bardach, Eugene, and Eric Patashnik. *A Practical Guide for Policy Analysis*. 6th ed. Washington, DC: CQ Press, 2020.
- Baruch, Avinoam, Andrew May, and Dapeng Yu. "The Motivations, Enablers and Barriers for Voluntary Participation in an Online Crowdsourcing Platform." *Computers in Human Behavior* 64 (November 2016): 923–31. <https://doi.org/10.1016/j.chb.2016.07.039>.
- Bourke, Michael L., and Andres E. Hernandez. "The 'Butner Study' Redux: A Report of the Incidence of Hands-on Child Victimization by Child Pornography Offenders." *Journal of Family Violence; New York* 24, no. 3 (April 2009): 183–91. <https://doi.org/10.1007/s10896-008-9219-y>.
- Bourke, Michael L., Derek Prestridge, and Melanie B. Malterer. "Interdiction for the Protection of Children: Preventing Sexual Exploitation One Traffic Stop at a Time." *Aggression and Violent Behavior* 30 (September 2016): 68–75. <https://doi.org/10.1016/j.avb.2016.07.009>.
- Boztas, Senay. "Picture Clue: Cops Turn to Amateur Web Sleuths to Help Crack Cases." *The Guardian*, February 4, 2019. <https://www.theguardian.com/world/2019/feb/04/picture-clue-cops-turn-to-amateur-web-sleuths-to-help-crack-cases>.
- Brabham, Daren C. *Crowdsourcing*. Cambridge, MA: MIT Press, 2013.
- Brackett Foundation, Jeff Macdonald, and Clara Péron. *Artificial Intelligence: Combatting Online Sexual Abuse of Children*. Los Angeles: Bracket Capital, 2019. <https://respect.international/wp-content/uploads/2019/11/AI-Combating-online-sexual-abuse-of-children-Bracket-Foundation-2019.pdf>.

- Bureau of Justice Statistics. *Volunteer Programs: Enhancing Public Safety by Leveraging Resources*. Washington, DC: Bureau of Justice Statistics, 2010.
https://bja.ojp.gov/sites/g/files/xyckuh186/files/Publications/IACP_VIPS_ResourceGuide.pdf.
- Bursztein, Elie, Einat Clarke, Michelle DeLaune, David M. Eliff, Nick Hsu, Lindsey Olson, John Shehan, Madhukar Thakur, Kurt Thomas, and Travis Bright. "Rethinking the Detection of Child Sexual Abuse Imagery on the Internet," 2601–7. New York: Association for Computing Machinery, 2019.
<https://doi.org/10.1145/3308558.3313482>.
- Canadian Centre for Child Protection. *Survivors' Survey: Executive Summary 2017*. Winnipeg, Canada: Canadian Centre for Child Protection, 2017.
https://protectchildren.ca/pdfs/C3P_SurvivorsSurveyExecutiveSummary2017_en.pdf.
- Christian, Carol. "Reddit Bureau of Investigation' Aids FBI's Battle against Child Predators." *Houston Chronicle*, October 25, 2016.
<https://www.chron.com/crime/article/Reddit-Bureau-of-Investigation-aids-FBI-s-10314455.php>.
- Cole, Zercoe. "Crowdsourcing Crime: Why the Public May Be Your Best Investigative Asset." *Police1*, March 23, 2017. <https://www.police1.com/police-products/video-storage/articles/crowdsourcing-crime-why-the-public-may-be-your-best-investigative-asset-WZIVQlrCG1XlMOU/>.
- Dobrin, Adam. "State-Level Estimates of the Number of Volunteer Police in the United States." *International Journal of Police Science & Management* 19, no. 2 (2017): 81–88. <https://doi.org/10.1177/1461355717695322>.
- . "Volunteer Police: History, Benefits, Costs and Current Descriptions." *Security Journal* 30, no. 3 (July 2017): 717–33. <https://doi.org/10.1057/sj.2015.18>.
- Docobo, Jose. "Community Policing as the Primary Prevention Strategy for Homeland Security at the Local Law Enforcement Level." *Homeland Security Affairs* 1, no. 1 (Summer 2005). <https://www.hsaj.org/articles/183>.
- Dwyer, R. Gregg, Michael Seto, Dana DeHart, and Elizabeth Letourneau. *Protecting Children Online: Using Research-Based Algorithms to Prioritize Law Enforcement Internet Investigations, Technical Report*. Charleston, SC: Medical University of South Carolina, 2016.
<https://www.ncjrs.gov/pdffiles1/ojjdp/grants/250154.pdf>.

- Europol. "Child Sexual Exploitation." Europol Crime Areas. Accessed July 10, 2020.
<https://www.europol.europa.eu/crime-areas-and-trends/crime-areas/child-sexual-exploitation>.
- . "Efforts Stepped-up to Identify Victims of Child Sexual Abuse." Europol Newsroom, January 16, 2015.
<https://www.europol.europa.eu/newsroom/news/efforts-stepped-to-identify-victims-of-child-sexual-abuse>.
- . "Europol Launches Public Appeal to Help Identify Victims of Child Sexual Exploitation." Europol Newsroom, May 31, 2017.
<https://www.europol.europa.eu/newsroom/news/europol-launches-public-appeal-to-help-identify-victims-of-child-sexual-exploitation>.
- . *Exploiting Isolation: Offenders and Victims of Online Child Sexual Abuse During the Covid-19 Pandemic*. The Hague, Netherlands: European Union Agency for Law Enforcement Cooperation, 2020.
<https://www.europol.europa.eu/publications-documents/exploiting-isolation-offenders-and-victims-of-online-child-sexual-abuse-during-covid-19-pandemic>.
- . "With Your Help We Are 21,000 Steps Closer to Saving a Child from Sexual Abuse." Europol Newsroom, June 1, 2018.
<https://www.europol.europa.eu/newsroom/news/your-help-we-are-21-000-steps-closer-to-saving-child-sexual-abuse>.
- Federal Bureau of Investigation. "Crimes against Children: Help Us Identify a Child Predator." Federal Bureau of Investigation, October 11, 2017.
<https://www.fbi.gov/news/stories/help-identify-child-predator-jane-doe-39>.
- . "Rescuing Victims of Child Sexual Abuse." FBI News, July 1, 2020.
<https://www.fbi.gov/news/stories/fbi-programs-work-to-rescue-victims-of-child-sexual-abuse-070120>.
- . "Seeking Information." FBI Most Wanted. Accessed May 14, 2020.
<https://www.fbi.gov/wanted/ecap/seeking-information>.
- Federal Emergency Management Agency. "Frequently Asked Questions: Wireless Emergency Alerts." Wireless Emergency Alerts, August 6, 2020.
<https://www.fema.gov/frequently-asked-questions-wireless-emergency-alerts>.
- Global Emancipation Network. "The Global Emancipation Network Approach, Mission, and Offerings." Global Emancipation Network. Accessed July 23, 2020.
<https://www.globalemancipation.ngo/global-emancipation-network-mission-offerings/>.

- Gonzales, Carlos. "Creating Impact: A Year On Stop Child Abuse —Trace An Object." Bellingcat, April 22, 2020. <https://www.bellingcat.com/news/uk-and-europe/2020/04/22/creating-impact-a-year-on-stop-child-abuse-trace-an-object/>.
- Goodison, Sean E., Robert C. Davis, and Brian A. Jackson. *Digital Evidence and the U.S. Criminal Justice System: Identifying Technology and Other Needs to More Effectively Acquire and Utilize Digital Evidence*. Santa Monica, CA: RAND, 2015. https://www.rand.org/pubs/research_reports/RR890.html.
- Greenberg, Martin Alan. *Auxiliary Police: The Citizen's Approach to Public Safety*. Westport, CT: Greenwood Press, 1984.
- . *Citizens Defending America: From Colonial Times to the Age of Terrorism*. Pittsburgh, PA: University of Pittsburgh Press, 2005.
- Hennessey, Susan. *The Elephant in the Room: Addressing Child Exploitation and Going Dark*. Aegis Paper Series No. 1701. Stanford, CA: Hoover Institution, 2017. https://www.hoover.org/sites/default/files/research/docs/hennessey_webreadypdf.pdf.
- Hilal, Susan M., and David Olson. "Police Reserve Officers: Essential in Today's Economy and an Opportunity to Increase Diversity in the Law Enforcement Profession." *Police Chief Magazine*, October 1, 2010. <https://www.policechiefmagazine.org/police-reserve-officers-essential-in-todays-economy-and-an-opportunity-to-increase-diversity-in-the-law-enforcement-profession/>.
- Hitchcock, Ben, Nhien-An Le-Khac, and Mark Scanlon. "Tiered Forensic Methodology Model for Digital Field Triage by Non-Digital Evidence Specialists." *Digital Investigation*, DFRWS Europe, 16 (2016): S75–85. <https://doi.org/10.1016/j.diin.2016.01.010>.
- Howe, Jeff. *Crowdsourcing: Why the Power of the Crowd Is Driving the Future of Business*. Currency, 2008.
- Huey, Laura, Johnny Nhan, and Ryan Broll. "'Uppity Civilians' and 'Cyber-Vigilantes': The Role of the General Public in Policing Cyber-Crime." *Criminology & Criminal Justice* 13, no. 1 (2013): 81–97. <https://doi.org/10.1177/1748895812448086>.
- Innocent Lives Foundation. "About Us." Innocent Lives Foundation. Accessed July 23, 2020. <https://www.innocentlivesfoundation.org/about-us/>.
- . *Get to Know the Innocent Lives Foundation*, 2020. <https://www.youtube.com/watch?v=SiDK9fiS928#action=share>.

- . *ILF 2019 Annual Report*. Orlando, FL: Innocent Lives Foundation, 2020.
<https://www.innocentlivesfoundation.org/ilf-2019-annual-report/>.
- International Centre for Missing & Exploited Children. *Child Sexual Abuse Material: Model Legislation & Global Review*. 9th ed. Alexandria, VA: International Centre for Missing & Exploited Children, 2018. <https://www.icmec.org/wp-content/uploads/2018/12/CSAM-Model-Law-9th-Ed-FINAL-12-3-18.pdf>.
- Internet Crimes against Children Task Force Program. “ICAC Task Force Program.” Internet Crimes against Children Task Force Program, 2017.
<https://www.icactaskforce.org/about-us>.
- INTERPOL. “Child Abuse Victims Identified Using INTERPOL Database.” INTERPOL News, November 8, 2019. <https://www.interpol.int/en/News-and-Events/News/2019/Child-abuse-victims-identified-using-INTERPOL-database>.
- Kang, Seong C. “Volunteer Involvement and Organizational Performance: The Use of Volunteer Officers in Public Safety.” *Public Performance & Management Review* 42, no. 3 (2019): 554–79. <https://doi.org/10.1080/15309576.2018.1483830>.
- Keller, Michael H. “A \$5 Billion Proposal to Fight Online Child Sexual Abuse.” *New York Times*, May 5, 2020. <https://www.nytimes.com/2020/05/05/us/child-abuse-legislation.html>.
- Keller, Michael H., and Gabriel J. X. Dance. “The Internet Is Overrun with Images of Child Sexual Abuse. What Went Wrong?” *New York Times*, September 28, 2019. <https://www.nytimes.com/interactive/2019/09/28/us/child-sex-abuse.html?smid=nytcore-ios-share>.
- Khanwalkar, Sanket Subhash. “Crime Intelligence 2.0: Reinforcing Crowdsourcing Using Artificial Intelligence and Mobile Computing.” Master’s thesis, University of California, Irvine, 2016. <https://escholarship.org/uc/item/6965r2v6>.
- Krause, Meredith. “Identifying and Managing Stress in Child Pornography and Child Exploitation Investigators.” *Journal of Police and Criminal Psychology* 24, no. 1 (2009): 22–29. <https://doi.org/10.1007/s11896-008-9033-8>.
- Lara, Miguel, and Kate Lockwood. “Hackathons as Community-Based Learning: A Case Study.” *TechTrends* 60, no. 5 (September 2016): 486–95.
<https://doi.org/10.1007/s11528-016-0101-0>.
- Larson, James, Victor Lewis, Kenneth Kay, and Chandrika Kelso. “Reducing the Cost of Crime through Reserve Police Officers and Volunteer Citizen Patrol.” *Research in Business and Economics Journal* 3 (July 2011).
<https://www.aabri.com/manuscripts/09316.pdf>.

- Larson, Selena. "Anti-Human Trafficking Group Uses Data to Track Criminals." CNNMoney, August 17, 2017. <https://money.cnn.com/2017/08/17/technology/business/human-trafficking-data-global-emancipation-network/index.html>.
- Lazareva, Inna. "Meet the Virtual Vigilantes Who Bust Human Traffickers from Their Laptops." Reuters, June 19, 2018. <https://www.reuters.com/article/us-global-trafficking-technology-hackers-idUSKBN1JG00F>.
- Luther, Kurt. "Solving AI's Last-Mile Problem with Crowd-Augmented Expert Work." Artificial Intelligence and Work: AAAI 2019 Fall Symposium, November 7, 2019. https://crowd.cs.vt.edu/wp-content/uploads/2019/12/Luther_Last-mile_AAAI_FSS_2019.pdf.
- Malega, Ron, and Joel H. Garner. "Sworn Volunteers in American Policing, 1999 to 2013." *Police Quarterly* 22, no. 1 (2019): 56–81. <https://doi.org/10.1177/1098611118785168>.
- Microsoft. "Help Stop the Spread of Child Exploitation." PhotoDNA. Accessed May 17, 2020. <https://www.microsoft.com/en-us/photodna>.
- Mitchell, Kimberly J., and Dana Boyd. *Understanding the Role of Technology in the Commercial Sexual Exploitation of Children: The Perspective of Law Enforcement*. Durham, NH: Crimes Against Children Research Center, 2014. <https://scholars.unh.edu/ccrc/37>.
- Muraszkiewicz, Julia. "Crowd Knowledge Sourcing- A Potential Methodology to Uncover Victims of Human Trafficking." In *Societal Implications of Community-Oriented Policing and Technology*, edited by Georgios Leventakis and M. R. Haberland, 23–30. Cham, Switzerland: Springer, 2018.
- National Center for Missing & Exploited Children. "Trends Identified in CyberTipline Sextortion Reports." Alexandria, VA: National Center for Missing & Exploited Children, 2016. <https://www.missingkids.org/content/dam/missingkids/pdfs/ncmec-analysis/sextortionfactsheet.pdf>.
- National Center for Missing and Exploited Children. "About NCMEC." National Center for Missing and Exploited Children. Accessed April 13, 2020. <https://www.missingkids.org/footer/media/keyfacts>.

- National Institute of Justice. *NamUS: A Powerful Tool for Law Enforcement Officers, Medical Examiners and Coroners*. Washington, DC: National Missing and Unidentified Persons System, 2016.
<https://www.namus.gov/content/downloads/publications/NamUsOverviewBooklet.pdf>.
- Office of Juvenile Justice and Delinquency Prevention. "About Missing Children's Day." National Missing Children's Day, 2020. <https://ojjdp.ojp.gov/events/missing-childrens-day/2020-commemoration>.
- Perez, Lisa M., Jeremy Jones, David R. Englert, and Daniel Sachau. "Secondary Traumatic Stress and Burnout among Law Enforcement Investigators Exposed to Disturbing Media Images." *Journal of Police and Criminal Psychology* 25, no. 2 (October 2010): 113–24. <https://doi.org/10.1007/s11896-010-9066-7>.
- Phillips, Scott W., and Amanda Terrell-Orr. "Attitudes of Police Supervisors: Do Volunteers Fit into Policing?" *Policing: An International Journal of Police Strategies & Management* 36, no. 4 (2013): 683–701.
<https://doi.org/10.1108/PIJPSM-10-2012-0102>.
- Planty, Michael, Lynn Langton, Christopher Krebs, Marcus Berzofsky, and Hope Smiley-McDonald. *Female Victims of Sexual Violence, 1994-2010*. Washington, DC: Bureau of Justice Statistics, 2016.
<https://www.bjs.gov/content/pub/pdf/fvsv9410.pdf>.
- Police Executive Research Forum. *New National Commitment Required: The Changing Nature of Crime and Criminal Investigations*. Washington, DC: Police Executive Research Forum, 2018.
<https://www.policeforum.org/assets/ChangingNatureofCrime.pdf>.
- BBC News. "Police Publish Child Abuse Clues Online," June 1, 2017.
<https://www.bbc.com/news/world-europe-40115549>.
- Ren, Ling, Jihong "Solomon" Zhao, Nicholas P. Lovrich, and Michael J. Gaffney. "Participation Community Crime Prevention: Who Volunteers for Police Work?" *Policing: An International Journal* 29, no. 3 (2006): 464–81.
<https://doi.org/10.1108/13639510610684700>.
- Rogers, Colin, and James Gravelle. "UK Policing and Change: Reflections for Policing Worldwide." *Review of European Studies* 4, no. 1 (March 2012): 42–51.
<https://doi.org/10.5539/res.v4n1p42>.

- Sanchez, Laura, Cinthya Grajeda, Ibrahim Baggili, and Cory Hall. "A Practitioner Survey Exploring the Value of Forensic Tools, AI, Filtering, & Safer Presentation for Investigating Child Sexual Abuse Material (CSAM)." *Digital Investigation* 29, no. supplement (July 2019): S124–42. <https://doi.org/10.1016/j.diin.2019.04.005>.
- Scurich, Nicholas, and Richard S. John. *The Dark Figure of Sexual Recidivism*. Legal Studies Research Paper Series No. 2019-09. Irvine, CA: UC Irvine School of Law, 2019. <https://papers.ssrn.com/abstract=3328831>.
- Splunk. *Tech Strikes Against Modern-Day Slavery*. Video, 2017. <https://www.youtube.com/watch?v=gIRk-OfiZYE&feature=youtu.be>.
- Ståhlbröst, Anna, Constantinos Marios Angelopoulos, Orestis Evangelatos, Srdjan Krco, Sotiris Nikolettseas, Theofanis Raptis, and Sebastien Ziegler. "Understanding Modes of Crowdsourcing and Related Crowd Motivators." In *ISPIM Conference Proceedings*, 1–17. Manchester, United Kingdom: The International Society for Professional Innovation Management (ISPIM), 2015. ProQuest.
- Thomson Reuters Foundation. "A Call to Action: Ending 'Sextortion' in the Digital Age." Thomson Reuters Foundation, July 19, 2016. <http://www.trust.org/publications/i/?id=f3b8d35c-27bf-4ba7-9251-abc07d588347>.
- Thorn. "Thorn Hackathon to Fight Child Exploitation." *Thorn* (blog), August 25, 2014. <https://www.thorn.org/blog/thorn-hackathon-fight-child-exploitation/>.
- Triebert, Christiaan. "New Objects Identified in Europol's 'Stop Child Abuse' Crowdsourcing Campaign — Third Update." Bellingcat, January 4, 2018. <https://www.bellingcat.com/news/uk-and-europe/2018/01/04/stop-child-abuse-campaign-3rd-update/>.
- U.N. Office on Drugs and Crime. "UNODC and IBM Organize Hackathon to Identify Tech-Based Solutions Against Human Trafficking." United Nations Office on Drugs and Crime, March 25, 2019. <https://www.unodc.org/unodc/en/frontpage/2019/March/unodc-and-ibm-organize-hackathon-to-identify-tech-based-solutions-against-human-trafficking.html>.
- U.S. Bureau of Labor Statistics. "Occupational Employment and Wages: 33-3051 Police and Sheriff's Patrol Officers." Occupational Employment Statistics, May 2019. <https://www.bls.gov/oes/current/oes333051.htm>.
- U.S. Census Bureau. "Southern and Western Regions Experienced Rapid Growth This Decade." Census Bureau Press Releases, May 21, 2020. <https://www.census.gov/newsroom/press-releases/2020/south-west-fastest-growing.html>.

- U.S. Department of Homeland Security. *Strategy to Combat Human Trafficking, the Importation of Goods Produced with Forced Labor, and Child Sexual Exploitation*. Washington, DC: Department of Homeland Security, 2020. https://www.dhs.gov/sites/default/files/publications/20_0115_plcy_human-trafficking-forced-labor-child-exploit-strategy.pdf.
- U.S. Department of Justice. *AMBER Alert Best Practices*. 2nd ed. Washington, DC: U.S. Department of Justice, Office of Justice Programs, 2019. <https://ojjdp.ojp.gov/sites/g/files/xyckuh176/files/pubs/252759.pdf>.
- . “AMBER Alert Training and Technical Assistance.” Washington, DC: Department of Justice, September 30, 2019. <https://ncjtc-static.fvtc.edu/Resources/RS00003868.pdf>.
- . “Frequently Asked Questions.” About AMBER Alert, October 20, 2019. <https://amberalert.ojp.gov/about/faqs>.
- . “Statistics.” AMBER Alert, May 2020. <https://amberalert.ojp.gov/statistics>.
- . *The National Strategy for Child Exploitation Prevention and Interdiction: A Report to Congress*. Washington, DC: Department of Justice, 2010. <https://www.hsdl.org/?view&did=20763>.
- . *When Your Child Is Missing: A Family Survival Guide*. 2nd ed. Washington, DC: Office of Juvenile Justice and Delinquency Prevention, 2002. <https://www.ncjrs.gov/pdffiles1/ojjdp/170022.pdf>.
- U.S. Sentencing Commission. *Federal Child Pornography Offenses*. Washington, DC: U.S. Sentencing Commission, 2012. https://www.ussc.gov/sites/default/files/pdf/news/congressional-testimony-and-reports/sex-offense-topics/201212-federal-child-pornography-offenses/Full_Report_to_Congress.pdf.
- Uzell, Donna, and Yesenia Leon-Baron. *Child Abduction Response Team Program Implementation Guide: Emerging and Best Practices*. Appleton, WI: AMBER Alert Training and Technical Assistance Program, 2018. <https://www.amberadvocate.org/wp-content/uploads/2018/05/CART-Implementation-Guide-web2.pdf>.
- Venkatagiri, Sukrit, Jacob Thebault-Spieker, Rachel Kohler, John Purviance, Rifat Sabbir Mansur, and Kurt Luther. “GroundTruth: Augmenting Expert Image Geolocation with Crowdsourcing and Shared Representations.” *Proceedings of the ACM on Human-Computer Interaction* 3, no. CSCW (November 2019): 1–30. <https://doi.org/10.1145/3359209>.

- . “GroundTruth: Augmenting Expert Image Geolocation with Crowdsourcing and Shared Representations.” *Proceedings of the ACM on Human-Computer Interaction* 3, no. CSCW (November 2019): 107:1-107:30. <https://doi.org/10.1145/3359209>.
- Vogt, Sophia Dastagir. “The Digital Underworld: Combating Crime on the Dark Web in the Modern Era.” *Santa Clara Journal of International Law* 15, no. 1 (2017): 104–24. <https://digitalcommons.law.scu.edu/scujil/vol15/iss1/4>.
- Volunteers in Police Services. *Volunteers in Police Services Add Value While Budgets Decrease*. Alexandria, VA: Volunteers in Police Service Program, 2011. https://www.theiacp.org/sites/default/files/2018-09/VIPS_police_service_add_value_while_budgets_decrease.pdf.
- Wasserman Schultz, Debbie. “Letter to Attorney General Barr and Deputy Attorney General Rosen,” August 5, 2019.
- Westlake, Bryce Garreth. “The Past, Present, and Future of Online Sexual Exploitation: Summarizing the Evolution of Production, Distribution, and Detection.” In *The Palgrave Handbook of International Cybercrime and Cyberdeviance*, edited by Thomas J. Holt and Adam M. Bossler, 1–29. Cham, Switzerland: Palgrave Macmillan, 2019. <https://doi.org/10.1007/978-3-319-90307-1>.
- Westlake, Bryce Garreth, Martin Bouchard, and Richard Frank. “Comparing Methods for Detecting Child Exploitation Content Online.” Odense, Denmark: IEEE, 2012. <https://doi.org/10.1109/EISIC.2012.25>.
- Whitehead, Don. *The FBI Story*. Washington, DC: Government Printing Office, 2011.
- Wolf, Ross, Stephen T. Holmes, and Carol Jones. “Utilization and Satisfaction of Volunteer Law Enforcement Officers in the Office of the American Sheriff: An Exploratory Nationwide Study.” *Police Practice and Research* 17, no. 5 (2016): 448–62. <https://doi.org/10.1080/15614263.2015.1031750>.

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